THIS WEEK'S NATIONAL PETROLEUM NEWS

The Recognized Authority on News, Markets and Technical Developments in the Oil Industry

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Coming Meetings

National Tax Assn., Biltmore Hotel, Oklahoma City, Okla., Oct. 14 to 19.

Tennessee Oil Men's Association, Hermitage Hotel, Nashville, Tenn., Oct. 21 and 22.

Oil Trades Association of New York, Waldorf Astoria, New York, Oct. 22.

Virginia Oil Men's Assoc., semi-annual meeting, John Marshall Hotel, Richmond, Va., Oct. 22.

Indiana Independent Petroleum Association, Hotel Severin, Indianapolis, Oct. 23, 24.

National Oil Marketers Association, Stevens Hotel, Chicago, Oct. 29 to 31.

Society of Automotive Engineers, annual dinner, New York, Nov. 4.

Independent Petroleum Assn. of America, Adolphus and Baker Hotels, Dallas, Tex., Nov. 4, 5.

American Petroleum Institute, 16th annual meeting, Biltmore Hotel, Los Angeles, Cal., Nov. 11 to 14.

California Natural Gasoline Assn., Los Angeles, Calif., some time in November.

American Institute of Chemical Engineers, Columbus, Ohio, some time in November.

1936

Wisconsin Petroleum Association, Plankinton Hotel, Milwaukee, Wis., Jan. 7, 8, 9.

Northwest Petroleum Assoc., Minnesota division, Ryan Hotel, St. Paul, Jan. 16 and 17.

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WILLIAM C. McDUFFIE, receiver for Richfield Oil Co. of California, is chairman of the reception committee which is planning to welcome eastern oil men to the annual meeting of the American Petroleum Institute at Los Angeles, Nov. 11 to 14.

Mr. McDuffie entered the oil industry as roustabout in 1909 in the Coalinga field. In 1915 he became production superintendent for Shell Oil Co. at Coalinga.

With Shell he was successively made general field superintendent, vice-president in charge of production and finally general manager of the world-wide production activities of the Royal Dutch Shell group, with headquarters at the Hague, in the Netherlands.

In 1928 he resigned to become president of the Pacific Western Oil Co. then being organized. He resigned from that position to untangle affairs of Richfield Oil Co. when it was thrown into receivership.

NATIONAL PETROLEUM NEWS

VOLUME 27 NUMBER 42

Wisconsin Managers for Majors Testify They are not Advised on Costs

MADISON, Wis., Oct. 9

By E. L. Barringer
N. P. N. Staff Writer

MAJOR oil company representatives in Wisconsin testified, at the hearing before the state markets department, that they are not informed as to costs of gasoline shipped by their companies into their territory.

They also said they do not know individual operating costs at company service stations under their jurisdiction.

Questioning of the chief officials of the major companies in the state was sought, by the independent marketers, to show that field managers, without knowledge of costs, are held responsible by their companies for getting business. The independents have charged that the major oil companies are gallonage-minded.

The Wisconsin markets department sat as a commission Oct. 8 and 9 to hear facts, on the petition of the Wisconsin Petroleum Association for a hearing to investigate marketing practices of major oil companies in the state. The hearings were adjourned until Oct. 29, in Madison.

Instead of the customary investigation procedure of placing jobbers and dealers on the stand first to recite grievances, the present hearing was opened by calling major company managers. Subpoenas had been served four days before the investigation began on 9 major company representatives in Wisconsin.

Standard Oil Co. of Indiana's Milwaukee division manager, John Budde, testified he had nothing to do with gasoline inshipments in his territory from the company except to place orders with the traffic department. He said that the formulae on which gasoline is charged to the division would have to be obtained from the company's general office in Chicago.

As for a gasoline quota, Mr. Budde testified his division is not given an allotment, although in the Milwaukee office there is correspondence and instructions from the Chicago office on this subject, he said.

Company service stations are given a monthly quota, he continued, predicated on the previous month's business and seasonal sales activity. Failure to make a quota does not result in a discharge, he testified, but station salesmen in such cases feel the effect in loss of commissions.

Mr. Budde testified further that he is not informed as to the operating costs of individual service stations, but does have in Milwaukee the average costs for all stations.

Responsibility for profitable distribution of gasoline is not part of his job, Mr. Budde continued, as the cost of the merchandise to the division, the sales prices, and margins are fixed for him. The scope of his work consists of distribution of gasoline, the final disposition of receipts, and the responsibility for charge accounts, he stated.

Fred Schultheiss, markets department commissioner, nettled by Mr. Budde's testimony, endeavored to have the Standard Oil manager admit that the job consists only of getting rid of the gallonage. "I want to know in case I should ever get a job like yours," Mr. Schultheiss explained.

WHEN Mr. Budde offered his job Mr. Schultheiss replied, "If that's all it amounts to I don't want it."

Testimony from other major company representatives indicated that cost accounting records are not kept, nor are they available in the field, and that these companies, like the Standard, have various divisions within the state to handle the various phases of marketing operations depending upon a company's setup. Following is the testimony from these companies on quotas and costs:

J. A. Sheridan, Milwaukee district manager, Shell Petro-

leum Corp., testified he is given a gasoline quota and makes it, and that he is not given an expense quota. He testified he does not know the charge made on gasoline to company service stations, and that he has nothing to do with retail prices or dealer margins.

R. D. Johnson, Milwaukee manager, Phillips Petroleum Co., testified he is given a gasoline quota based on the same month's sales in the previous year, plus a 10 or 11 per cent increase. N. S. Moon, Chicago manager for Phillips, then testified he is given a gasoline quota for the entire division, and allocates it to various points, but the company is not gallonage minded, he said.

F. C. Strum, wholesale representative in Milwaukee for The Texas Co., testified his job was to promote wholesale sales and that he has no knowledge of station costs. However, once a month a communication is received on bulk plant costs, and the company strives for a 1.5-cent per gallon cost, he said.

J. F. McCarthy, assistant sales manager in Wisconsin for Sinclair Refining Co., testified he is concerned only with disposing of gallonage, and he does not know of the company's profit and loss statement for Wisconsin.

F. B. Bunn, Wisconsin manager for the Pure Oil Co., was not questioned regarding his knowledge of operating costs, except on one Milwaukee station. Mr. Bunn, however, in explaining some figures on this station stated that his company's costs are decentralized into division offices. The point was not pressed for further explanation.

After these major company managers in Wisconsin had given testimony on their lack of knowledge of marketing costs and on gasoline quotas, evidence was presented from the state income tax department files to show that certain major companies in recent years had reported losses on taxable income and had not paid an income tax on Wisconsin marketing operations.

An audit authorized by the Wisconsin Petroleum Association was presented by Harry L. Erb, from the Milwaukee office of the accounting firm of Haskins & Sells. Sales and taxable losses were presented on Standard Oil, Wadhams, Cities Service of Wisconsin, Sinclair, Texas, and Barnsdall companies. The data was similar to that published in a NATIONAL PETROLEUM NEWS editorial, and that was circulated widely when a Madison, Wis., jobber published the data earlier in the year.

Meager service station operating cost data was developed, except from the Wadhams Oil Co. and the Pure Oil Co., as records for most companies are kept outside the state. The attorney for the independents asked that cost data from Standard Oil, Barnsdall and Shell be available for future hearings.

DEVELOPMENT of operating cost figures ran on a legal snag near the close of the hearing when W. L. Zust, president and manager of the Cities Service Oil Co. of Wisconsin, refused to submit information on a company station in Milwaukee except in confidence to the state markets department. Mr. Zust said he objected to placing such information in a public record where it could be used by competitors.

Fred M. Wylie, attorney for the Wisconsin Petroleum Association, declined to receive any confidential information. W. R. Allen, Sinclair Refining Co. attorney, then asked that details given by his company be stricken from the record and that every company be placed on an equality in disclosing, or not disclosing cost data given at the hearings.

The markets department settled the issue for the first hearing by requesting all interested parties to submit briefs by Oct. 19 on how far the department, which is the arm of the state legislature on trade practices and competition, can go in seeking cost data in the investigation.

Purpose of the inquiry on costs was to show alleged excessive investments and operating costs at stations along Milwaukee's swank West Wisconsin Ave. Milwaukee, like other large cities, has one semi-business-residential street leading from the main business district on which gasoline distributors strive to make an impression with fine stations.

The inquiry developed the point that costs available did not include such items as advertising or management costs, merely the bare items for running the particular station.

Companies that gave the most complete information were Wadhams and Pure Oil. M. G. Peeters, vice-president, and J. B. Wilbor, marketing statistician, appeared for Wadhams, as the company secretary who had been subpoenaed was unable to appear this week and was excused.

Wadhams' stations on West Wisconsin Ave., which were brought into the investigation are at 26th and 27th streets and the following costs and data were submitted, in addition to the deeds and leaseholds.

The 26th St. station was acquired by the Bartles-Maguire Oil Co. Oct. 14, 1926, and became a Wadhams station in 1929 when the two companies merged. The station was deeded to Wadhams April 29, 1933. No price was given in the deed from Bartles-Maguire to Wadhams, but testimony later placed the total station cost at $35,000.

The 27th St. station represents two parcels, the corner real estate being company owned now, while a parcel along 27th St. at the rear is under a 99-year lease, at $1800 annual rental. This lease dated July 9, 1928, provides for the privilege of purchase by Wadhams within ten years at $35,000. Also, the company was to build a two-story fireproof building on the property, value to exceed $15,000, but this provision was fulfilled later by the company making an addition to the station in excess of that minimum requirement.

The original cost of the 27th St. station was given as $73,196.41. Included was land $16,466.31; leasehold $7850.71; buildings $37,693.77; operating equipment $10,382.16 (this is a complete station with enclosed lubrication facilities); office

(*Continued on page* 14)

The Editor's Viewpoint

Major Company System Keeps Managers Gallonage-Minded

By Warren C. Platt, *Editor*

TO THE casual observer, the Wisconsin legislative investigation of oil marketing seems clearly to have brought out one fact, that the representatives of the larger companies are gallonage-minded and, by their very division financial setups, cannot be else but gallonage-minded.

The investigation shows that these division or state managers do not operate on any profit and loss basis; that, in fact, they have no idea whether they are making a profit for their companies or not.

They know what they pay out of a local bank account for payroll and such expenses as are better paid locally and they know the gross of what they take in and check to the main office of the company. However, what the merchandise cost is, what the general overhead is and hence whether the prices they are at least most instrumental in charging for the company's merchandise, are sufficient to bring the company a profit, they do not know.

Obviously, therefore, the fundamental character of the setup is such as to place all emphasis upon gallonage and none at all on profit, which can only come from high enough prices and low enough costs. A division manager has no way of knowing whether the lower price he may ask for or make to meet some competition is the price which will throw his division into red ink or not, or whether the pay increases he wants for some employes will do the same thing. A division manager can sit down and, by taking the open tank car price on the products, as published, and the freight rate to his territory, he can get a merchandise cost figure but what overhead should be figured in he cannot know.

It also is true that the larger integrated oil companies have supervisors out and salesmanagers and their assistants who are continually arguing for better prices and lower costs and the division manager is so supervised that he cannot run wild, at least to any great extent. Still the only score that is kept on the card that he can see representing his performance, is that showing the number of gallons sold. He can figure this against his price and see how that compares with past prices but here again he knows that there is constant improvement in methods all along the line from the well to him and that just the bare fact that the sales price of a product five years ago was 10 cents, while today it is 5 cents, does not necessarily mean the price is a losing one.

The managers of divisions and for the state of the major companies testified to this Wisconsin committee that they did not know the cost of their merchandise and they did not know what profit or loss they were making for their companies; that the profit and loss was all figured out at headquarters and they were not informed.

Such, it is true, has been the method of operating nearly all of the larger companies from the beginning of the industry. There are good reasons for it, but whether all the reasons for it today offset today's disadvantages may well be considered a current and serious question.

Since the beginning of business what a man or a company made or lost has been considered private. Companies with many stockholders and with their stock selling on public exchanges have come to give out this information but there generally is no breakdown of the profit and loss by subsidiaries and departments. The old policy thus is largely intact.

In addition to this custom from the past there is also a reason to be found in not placing this profit information in employes' hands, because of the danger of its being misunderstood, especially when it may be impossible to make it complete for every division and when a business is operated as a whole. Also there is reason in the fact that states are more and more trying various ways of reaching profit done within their borders, as well as property and business, for tax purposes. If every company kept a profit and loss statement on every state on business done therein would not that invite most strongly taxation of such profit? Carrying the thought still further, if the break-down was by counties would not the counties showing the most profit for a business seek to grab some of that profit?

Furthermore, if all such profit and loss statements were available, to be pawed over by a legislative committee and then the legislature, what weird kind of legislation might not be concocted? The question of the right of the Wisconsin legislature, or that of any other state, to have such information as it is seeking of oil marketing, might well be challenged by the holders of that information.

We do not here either deny any right of the

Wisconsin committee to get this information or question the desirability of its having it in this case. Our Congress and legislatures are reaching deeper and deeper into the private files of our businesses and of our lives and maybe it is the best thing for mankind. It probably is only a question of time when it will be applied to every one.

One thing is certain, a lot of such information in the minds of men who are ignorant of the particular business, in fact even ignorant of any business, is very often interpreted against the interests of the business involved and that unfairly so. Even though the owner of the information tries to explain it, he may be unable to do so successfully no matter how justified he may be in creating those figures in the first place.

So when one looks at the none-too-edifying spectacle presented by the major oil company representatives on the witness stand at Madison the past week, one should not be too hasty in one's criticism. There is much to be said of the major oil company's position.

However, in looking at the many profitless activities in oil marketing the country over and considering the trend of the times for more and more public information of heretofore business secrets, one cannot help but suggest that the major company executives consider more carefully than they have the advantage to come from putting every sizeable sales unit on a profit and loss basis. Then the operators of those units will know whether they are sound managers and good employes or whether they are incompetent and should be fired.

There can be no question but the big strength of the small marketing operator lies in the fact that, while he may cut some corners and irritate the big companies by moving faster than they can, nevertheless he knows on the instant if a price he makes will put him in the red. When the Independent marketer makes a losing price he pays for it out of his income and he immediately feels the effect of a smaller income but the manager for a major works on a salary and no matter what losses his prices or policies or efforts may cause, his income does not suffer, except over a long period of time perhaps. Some times not even then for the fact remains that most companies still are gallonage minded rather than profit minded.

Today division managers and general sales managers and vice-presidents in charge of marketing are looked upon as big and successful business men by their communities and friends. But if these men were publicly known by their profit and loss statements on their own activities, how long would they be looked up to by friend and associate? We do not mean to belittle them for they are mostly the victims of circumstances but if their performance was to be made public, there is no question these men would be fighting every oil company practice that worked against their showing a good profit. If they were not successful then they would certainly put the blame where it belongs, wherever that is.

One cannot help but wonder at how much different the oil industry might be today had profit and loss statements been figured on marketing alone, on a fair basis, starting a dozen years ago. Certainly there would not have been the big orgy of giving away pumps, painting every dealer's house and barn and chicken coop, making special inside deals and doing all the other things which have thinned gallonage so that marketing costs run many times any margin that now may actually exist.

When the marketing departments did all these foolish things it simply followed orders to "get the gallonage." What could not the same men have done had those orders been instead, "get the profits"?

Changes do not come over-night. The losing practices came on gradually and one led to another. The return to profit will have to be over the same route but is not the start of that route in placing every marketing department and every division, at least, on a profit and loss basis?

Some bigger companies have tried it in one way and another, and so far it seems to be working out, and on all sides, as evidence that it pays, are the independent marketers who always have been working on that basis.

Wisconsin Investigation

(*Continued from page* 12)

furniture and fixtures $803.46.

Reserve for depreciation on this station up to Oct. 1, 1935 was $22,858.41. Testimony was that the land apparently has been depreciated, and is not included in this figure.

Following are the operating costs in cents per gallon given for these two stations:

	26th St.	27th St.
1932	2.42	2.60
1933	3.62	3.45
1934	3.22	4.25*
1935**	4.41	3.32

*For more than six months in 1934 the street was closed.

**First eight months of year.

Following is the explanation of charges in arriving at costs:

Gasoline is charged to the stations based on the average price of purchases on the open market of each grade of gasoline on a Group 3 freight basis. This unit price per gallon is then multipled by the amounts delivered, to determine total gasoline costs for the individual station. Handling costs on the gasoline from the tank car to the service station are not included.

Management, investment and advertising costs are not included in the cost figures presented. Included, however, as given in the testimony, are depreciation on building, equipment, furniture and fixtures; maintenance on building and tools; supplies such as paper and paper cups; taxes, as estimated for the first six months with the difference between monthly estimate and actual taxes covered in the final month.

Insurance is not included, as the company carries its own risks. Loss in charge accounts also is not charged to a given

station, as purchases may include other items than gasoline and may be made at more than one station, hence such losses are against total sales.

Depreciation rates are 5 per cent annually on buildings and on operating equipment.

There is no attempt to allocate salaries as to products sold.

In segregating gasoline costs, gross profits on all other products sold are subtracted from total station expenses to arrive at the expense on gasoline sales.

Pure Oil Co.'s station brought into the hearing is at 15th St. and West Wisconsin Ave. This station was opened in June, 1935, so figures were available only for the complete operating months of July and August.

The property was leased by Pure Oil and the company's $24,604.01 investment is in the building and equipment.

By August gasoline sales had reached 11,106 gallons. Operating expenses, including equipment depreciation for the month, were $1475.95, and net operating income less depreciation was a $373 loss, it was stated at the hearing.

Mr. Bunn explained that depreciation on the building is not included yet. Station costs are being checked by the company's engineering department at the Chicago home office, then will be sent to the division office and depreciation rates applied starting with the first month of operation.

Mr. Bunn admitted that the station had advertising value, but that any losses could not be charged back to the advertising account. Also, the station is overmanned now, as this is a training station for salesmen, he stated.

In making the investigation on the site Mr. Bunn testified operating costs at stations of other companies along the avenue had not been considered, but he said he believed Pure Oil's station would show a profit.

Since the station was built an organization outside the oil industry has offered to rent the station from Pure Oil for $450 a month, he testified.

A Shell company station at 2455 West Wisconsin Ave. came into the investigation. This station was leased to the Barnsdall-O'Neil Oil Co., of which Mr. Sheridan was a vice-president, on May 31, 1932, for five years with a five-year renewal option. Rent was $325 monthly for 1932 and 1933, and $350 monthly for the balance of the lease and for the renewal period.

Gallonage figures for 1935 showed January the lowest month at 6125 gallons, August the best month at 11,477 gallons.

Scattered gasoline sales costs for three Sinclair stations in Milwaukee were read into the record, ranging from 8 to 30 cents a gallon. Mr. McCarthy explained that everything must have been charged to gasoline, and details would have to come from the Chicago district office.

SINCLAIR'S representative related at the hearing that the Goodyear one-stop station in Milwaukee, supplied by Sinclair, receives only the regular dealer's margin. Mr. McCarthy based his statement on the fact that gasoline delivery tickets carry only the customary discount.

Sinclair's credit card policy in Milwaukee also was aired. Mr. McCarthy explained that last fall cards were issued without any check of credit responsibility, upon authorization of salesmen and bulk agents who sent in the names. Many of these cards were never used, hence the practice was discontinued after two or three months, and all cards not used were cancelled in June, 1935

Now the company issues credit cards only after credit investigation and to those who will use them. Credit applications are made through the Milwaukee office and sent to the Chicago office. The credit department in Chicago has a man in the Milwaukee bulk plant office to check credit risks. Mr. McCarthy explained that credit cards are reissued every 60 days.

Two dealers were on the stand to explain their contracts. One of these Wilbert F. Reinke, Wauwatosa, a Milwaukee suburb, explained that his father owns the station and receives $85 a month rental from The Texas Co. Mr. Reinke rents from The Texas Co., paying 0.5 cent a gallon on the first 5000 gallons and 2 cents on all above 5000 gallons of gasoline sold monthly, with a margin of 4-4-4 cents. Average sales are about 6000 gallons monthly. The arrangement has been in effect since 1933.

The other dealer was Henry Wirth, station operator at 2310 West Fond du Lac Ave., Milwaukee. In May, 1935, this dealer signed a supply contract, and an equipment lease contract for a sign, two oil display racks and a 15-gallon drum with Barnsdall.

Another contract called for installation of a Barnsdall neon sign. If the dealer remained an exclusive account for less than a year the removal cost to the dealer would be $200, if for less than two years the removal cost would be $100.

The dealer claimed there was a verbal side agreement whereby he received $35 a month rental, 20 yards of crushed stone for the drive, and four T-lights for the gasoline island, since he owns his own equipment.

During a price war in June this year the dealer claimed his 3.5-3.5-3 cent margin was cut, but when he complained the full margin was restored.

The dealer changed his account to Wadhams in September, 1935, claiming Barnsdall was slow in fulfilling its part of the contract and that the side rental agreement had been broken.

P. J. McCaffery, Barnsdall attorney, cross-examined the witness about correspondence in regard to claims for shortage, and on collection of the $200 for removal of the neon sign as the account was not exclusively Barnsdall's for a year.

W. T. Hanson, Barnsdall Oil Co. manager at Milwaukee, had been subpoenaed, and was called three times after this dealer testified but was not in the room.

Purpose of the dealer testimony was to get evidence in the record as to deals made by major companies, to show the competition independent jobbers encounter.

Investigation of Selling Below Cost Considered by Trade Commission

By Teletype

WASHINGTON, Oct. 15

THE Federal Trade Commission has received so many complaints that certain major oil companies are "selling below cost" that the commission is considering a general investigation of the matter, it was learned today.

One of the latest complaints received was that from the Illinois Petroleum Marketers Association against Standard Oil Co. of Indiana, filed September 23. Beyond acknowledgment of receipt of the complaint, no definite action has been taken as yet, commission officials said.

However, the Illinois complaint, along with others, has been referred to the commission's legal staff for study with a view to a possible general investigation of the whole question of whether some large integrated oil companies are selling at less than the cost of their marketing operations, it was said.

The commission would not disclose where other complaints were from but it is known that several have been received from independent marketers in the southern states and others from the middle west.

The complaint of the Illinois marketers was filed by G. A. Primm, association secretary. In it he alleged that Standard of Indiana has fixed margins to lessen competition rather than to meet it.

Independent jobbers must meet wholesale and retail price postings of the Standard, Mr. Primm stated. Otherwise they will not be able to retain their business.

"The jobber gross margin has been fixed at 5.5 cents f.o.b. destination on regular grade gasoline based on normal prices, and from this gross margin they have fixed a discount allowance to dealer customers, which in Metropolitan Chicago is 4 cents a gallon and in other sections of the state 3.5 cents a gallon, leaving a gross margin of profit to Independent jobbers based on normal prices of 1.5 cents in Metropolitan Chicago and 2 cents in other Illinois territory," Mr. Primm charged.

"At points where prices are subnormal the jobber margin has been further reduced as for instance in Metropolitan Chicago where subnormal prices now exist, the full 5.5 cents a gallon established gross margin has been entirely wiped out by an increase in dealer discount and reduction from the normal prices, thus making it compulsory for independent jobbers operating in that territory to sell gasoline below cost. Even at points where normal prices prevail, independent jobbers of Illinois cannot operate on as much as a cost recovery basis on the gross margin as has been fixed by the Standard Oil Co. of Indiana.

"FOR the foregoing reasons the independent jobbers and marketers of Illinois through this Association set forth in their complaint that the prices fixed by the Standard Oil Co. of Indiana in Metropolitan Chicago and other points of the state where subnormal prices prevail, has been not for the purpose of *meeting* competition but to *lessen* competition.

"This is evidenced by the fact that when local prices are met only a minor portion of competitive conditions are taken into consideration (in most instances not more than 5% of the total volume of business in the affected community); thus, the act of meeting competition so instigated by the Standard Oil Co. as the market maker does not constitute a just cause for them to reduce prices to a ruinous level, making it prohibitive for the remaining 95% of competition in the community to operate even on cost recovery.

"It is, therefore, the complaint of independent jobbers that the action of the Standard Oil Co. in meeting a minority competitive situation and establishing jobber margins at an unequitable ratio which tends to reduce their profits, is for the sole intent of lessening competition and is an unfair trade practice and contrary to the Clayton Act functioning under the Federal Anti-Trust Laws.

"Concerning margins as have been established by the Standard Oil Company of Indiana, it can be proven conclusively that if Independent jobbers whose operating expenses are lower than the Standard Oil Co. of Indiana, are unable to break even on the present schedule of margins, that their larger competitors are facing even greater losses in the marketing branch of their business. However, the Standard Oil Co. and other integrated companies who operate over a wide range of territory have the advantage by reason of their diversified operations of absorbing their losses in the marketing branch of the industry through the excessive profits they are making in their production and pipeline divisions.

"With these facts the Commission can readily see that the Standard Oil Company as named in this complaint are unable by their failure to obtain even cost recovery for themselves in the marketing branch of their business, and by their refusal to widen the gross margin for the advantage of all classifications of marketers, are about to destroy the business of Independent jobbers and create a still greater monopoly for themselves . . ."

Moves to Protect Exports Of Pennsylvania Oil

OIL CITY, Pa., Oct. 12.—Steps to protect export shipments of motor oil marketed by its members were taken by the Pennsylvania Grade Crude Oil Association through adoption of a new regulation today. The new ruling is designed to prevent substitution or adulteration of the contents of drums or barrels destined for overseas consumption, according to J. E. Moorhead, executive secretary.

All drums hereafter will be sealed with metal closures. The closure seals will bear the emblem lithographed in blue and gold and are of such construction that it is impossible to open the container without destroying the seal. The permit number will appear on the seal to identify the supplier. All other means of identifying emblem oils for export shipment, such as paper labels, stencils, decalcomania reproductions, and other devices bearing the insignia are prohibited.

U. S. Crude Stocks Cut 455,000 Barrels

WASHINGTON, Oct. 15.—Despite an increase of 548,000 barrels in California, crude oil stocks in the U. S. were 455,000 barrels lower during the week ended Oct. 5, the Bureau of Mines reported today. Stocks totaled 304,595,000 barrels on Oct. 5 as compared with 333,511,000 barrels on Oct. 6, 1934.

Grade of Crude	Sept. 28	Oct. 5	Change
	(Thousands of Barrels)		
Pennsylvania grade	4,788	4,801	+ 13
Other Appalachian	903	843	— 60
Lima-N. E. Ind.-Mich.	1,488	1,536	+ 48
Ill.-S. W. Ind.	11,374	11,282	— 92
N. La. and Ark.	10,735	10,628	—107
W. Tex. and S. E. N. Mex.	29,868	29,494	—374
East Texas	24,001	24,051	+ 50
Other Mid-Continent	135,659	135,301	—358
Gulf Coast	25,100	25,030	— 70
Rocky Mountain	26,988	27,020	+ 32
California	30,434	30,982	+548
Domestic	301,338	300,968	—370
Foreign	3,712	3,627	— 85
Total	305,050	304,595	—455

Tax Regulations Ready Soon

By Teletype

WASHINGTON, Oct. 15.—Regulations covering changes in administrative provisions of the federal gasoline and lube oil taxes, being drafted by the Internal Revenue Bureau, will be ready in a week or ten days, it was learned today. Delay in getting out the regulations does not alter the fact that the changes, covered by the Gore amendment to the tax-the-rich law, went into effect Oct. 1.

The changes include a provision making tax-free all sales to any government agency and authorizing a tax refund or credit whenever the ultimate sale is for a tax-free purpose.

To Tell Results of Michigan Probe Of Marketing at Convention

WASHINGTON, Oct. 14

EACH session of the National Oil Marketers Association's annual convention at Hotel Stevens, Chicago, Oct. 29 to 31 will be crammed with discussion of topics of vital interest to the independent oil jobber.

Beginning at 10 o'clock each morning, the convention sessions will be adjourned at noon, leaving the afternoons free for inspection of the trade exhibit on the same floor and adjoining the convention hall. Whether they are members of the N. O. M. A. or not, all independent jobbers will be welcomed to the convention sessions. Discussions from the floor will be limited strictly to independent jobbers.

Arrangements are being made for each state jobbers association to have a booth of its own at the convention, which will serve as a meeting point for jobbers from that state.

Discussion of the Michigan state oil marketing investigation at the Oct. 29 (Tuesday) morning session will follow an address by Hazen J. Hatch, of Marshall, Michigan, who is counsel for Michigan independent jobbers at the oil probe.

Mr. Hatch has been associated with a steering committee of five marketers in developing evidence for the committee of the Michigan legislature. He will tell the national association why the investigation was sought, what testimony has developed thus far and what may be expected to be accomplished.

A report on the current investigation by the Department of Justice to determine whether major oil companies are fixing prices in violation of the federal anti-trust laws will be made Wednesday by G. D. Givens, of Henderson, Kentucky. Mr. Givens headed the N.O.M.A. committee which called upon Attorney General Cummings last June and requested the investigation.

The Wednesday session will also include discussion of proposals to disintegrate major oil companies to "prevent absorption of marketing costs by their producing and refining branches". W. E. White, of Petersburg, Virginia, will report on his committee's study of the subject and make recommendations to the convention.

Thursday is "Code Day". The attitude of independent oil jobbers towards a voluntary code will be determined. Discussions will follow a comprehensive report, with suggestions, by M. B. Whiting, of Clifton Forge, Virginia, chairman of the association's code committee.

THE national legislative session will be reviewed at the Thursday session by Paul Hadlick, national secretary. Policies will be formulated and a program adopted for the independent jobber to guide the work of the national association when Congress meets in January. Existing and prospective federal legislation to control oil production will be taken up. The convention will be asked to endorse action taken at the association's Washington meeting June 17 "vigorously opposing any measure or movement to suspend or weaken the anti-trust laws".

Presiding officers for the different sessions have been selected for their familiarity with the main topic to be discussed. C. E. Bauer, of Louisville, Kentucky, vice-president, will call the meeting to order and speak on the "Outlook for 1936". Mr. Bauer is the ranking officer, Eric V. Weber, of Cincinnati, having resigned as president at the end of June. Fred E. Bergfors, of Quincy, Massachusetts, a director, will preside Tuesday, and speak on "Why the Independent Jobber Needs a Strong and Active National Association." Mr. Whiting will preside at the Thursday meeting.

Shakeup by Ickes Gives Glavis Control Of The Federal Tender Board

By A. M. Petty
N. P. N. Staff Writer

WASHINGTON, Oct. 12 SECRETARY ICKES has given the Federal Tender Board a violent shake up and Louis R. Glavis has come out on top.

Glavis, director of the investigations' division of the Interior Department—sometimes called Ickes' OGPU—has been the storm center of several bitter controversies within the Oil Administration.

It appears from this move that Glavis has gained control of all the enforcement machinery of the Connally act, for which Congress appropriated $500,000 during the current year.

The tender board is the agency set up in East Texas to enforce the federal Connally law against shipment of "hot" oil in interstate commerce. The board has its own investigative unit, known as the Federal Petroleum Agency.

Two new members of the tender board were appointed. They were C. L. Waterbury, one of Glavis' special agents, and James A. Frear, 74-year old ex-congressman from Wisconsin and long-time acquaintance of Glavis. Thomas G. Kelliher, another Glavis agent, was designated acting director of the Federal Petroleum Agency.

This is the second shake up in the tender board since it was established eight months ago. Following up their protests that Glavis was not co-operating in the effort to check shipments of "hot" oil, members of the tender board last spring had a "show-down" with Ickes which resulted in the setting up of an independent investigative agency for the board.

G. W. Van Fleet, an insurance man from Winnetka, Ill., Ickes' home town, was named director. Announcement was made that Glavis had been instructed to turn over his records and personnel in East Texas to Van Fleet. The understanding seemed to be that Glavis would withdraw from East Texas. But he did not.

Glavis' agents moved over to Henderson, a few miles from the tender board's headquarters in East Texas and set up an office "to enforce the oil code." Complaints that Glavis' agents were "harassing" the board and its staff continued. Norman L. Meyers, chairman, came to Washington early in June and has been here ever since. M. S. McCorquodale resigned from the board July 1.

Since McCorquodale left, John Davis, who is under 30 years of age has run the board alone. Davis had a large part in drafting the Connally act regulations. Reports are that he, too, is slated to be recalled to Washington. However, it is likely that, because of his experience, he will be continued on the board, for a time at least.

Mr. Frear was appointed chairman of the tender board, replacing Meyers who resigned "to devote his entire time to the duties of executive secretary of the Petroleum Administrative Board at Washington," it was asserted.

"Mr. Frear," the official announcement continued, "has been identified with public service in both Wisconsin and the nation for many years. Beginning law practice at Hudson, Wis., in 1884, he served successively several terms as city attorney and as district attorney of St. Croix County, three terms as a member of the Wisconsin house of representatives, a term in the state senate, and then six terms as secretary of state for Wisconsin.

"In 1913 he was elected a member of Congress from Wisconsin, and served his state in this capacity for 22 years. For 15 years he was a member of the Ways and Means Committee, and he was chairman of a committee which investigated the aviation industry's world-war activities.

"Privately, in his studies of foreign governmental activities, he has made an extensive survey of foreign oil fields," the announcement added.

Appointment of Frear surprised political observers here. However, this was not through the fact he campaigned against the Democratic presidential nominee in 1928 or that he did not actively support Roosevelt in 1932—that can be expected of Ickes, according to disgruntled Democratic job-seekers.

Frear was supposed to have his eye on an appointment to the Federal Trade Commission or the Tariff Commission. It was a surprise that a man of his age should be given such a tough assignment as shutting off the "hot" oil flow in East Texas. Frear's salary probably will be between $6500 and $7500. Davis' salary is said to be $6500 a year.

Frear, a Progressive Republican, did not seek re-election in 1934 when the La Follette group dropped its Republican label and formed a third (Progressive) party in Wisconsin.

His colleagues remember Frear as being somewhat quick to anger and sensitive to criticism. He filled scores of pages in the Congressional *Record* with answers to those he thought were criticising him. In the matter of legislation, Frear is remembered principally for the number and variety of investigations he proposed. He gained newspaper headlines as chairman of the subcommittee investigating war expenditures for aviation in 1919.

Frear also served on several investigative expeditions which took him to many parts of this country and abroad. Around the Capitol, these globe-trotting jaunts at the taxpayers' expense are called "junkets."

Application of the term "junket" to a proposed trip to the Pacific Coast in connection

with Frear's aviation probe, resulted in an explosion 16 years ago which may echo in his new post today. The epithet was hurled in a statement by Democratic National Committee Chairman Cummings which also called Frear's group a "smelling committee."

Frear peremptorily summoned Cummings before his committee. With loud shouts and much table-thumping, Frear demanded that the Democratic party chairman explain his statement. Cummings smilingly stood his ground, maintaining that the inquiry was for partisan political purposes and a waste of the taxpayers' money.

Today, that same Cummings is U. S. Attorney General and will be called upon to co-operate closely with Frear in bringing prosecutions under the Connally act.

Admitting that he is not an "expert" on oil, Frear stands on his record as an investigator, which dates back even beyond his days in Congress to the time he conducted the Wisconsin insurance investigation. While his principal contact with the oil industry was in the oil tariff hearings before the Ways and Means Committee, Frear says that he has travelled through important oil fields of this country and abroad.

Indication that Frear's appointment was accomplished by Glavis was seen in the ex-congressman's statement that he is not acquainted with Secretary Ickes but has known Glavis since the aviation investigation, more than 16 years ago.

Mr. Frear impresses one with his sincerity. Although he says he has no plans for handling the East Texas situation, he seems eager to tackle the problem. His 74 years seem not to have borne heavily upon him; his gait is as brisk as that of many men 20 years younger.

The ex-congressman says that his appointment on the tender board was "totally unsought and unexpected."

Not much could be learned here about Waterbury, the other new appointee to the tender board. Reports are that he is related to Mrs. Franklin D. Roosevelt. Born in 1886 in New York, Waterbury was educated at Groton, Mass., which is the school traditionally attended by the Roosevelts and their kinsfolk. He is said to have lived in Tulsa from 1922 to 1925 and in Fort Worth, Texas, 1926 to 1929.

The official announcement said that Waterbury "has had considerable business experience with advertising, brokerage, and manufacturing companies in New York City and as a rancher and oil operator in the southwest. Recently, he has been serving as an acting special agent for the Division of Investigations, Department of the Interior, in charge of oil enforcement in the New York area."

No details about Waterbury's activities as an "oil operator in the southwest" could be obtained at the Interior Department.

Kelliher, who has been designated acting director of the Federal Petroleum Agency, is about 30 years old and comes from Beverly, Mass. Graduating from Georgetown University law school in 1931, Kelliher served as a G-Man with the Justice Department until he joined Glavis' unit about two years ago. No mention is made in the announcement of Van Fleet, whom Kelliher replaces, but it is believed that a place will be found for him in the Interior Department.

Dr. Hans Tropsch

While this shakeup was not announced until Oct. 10, it is believed that the arrangement was completed before Ickes left with President Roosevelt.

Undersecretary of Interior Charles West (former Ohio congressman) is handling oil matters while Ickes is away. Glavis is said to have the ear of West. With Charles Fahy, chairman of the PAB, gone, it appears there is no one to dispute Glavis' position as Ickes' adviser on oil.

Famous Oil Research Chemist Dies

CHICAGO, Oct. 12.—Dr. Hans Tropsch, associate director of research of Universal Oil Products Co., Chicago, died Oct. 8 in Essen, Germany, after an illness of several months.

Dr. Tropsch was a world authority on coal and oil chemistry, particularly catalytic hydrogenation of carbon monoxide from coal to produce gasoline and other oils.

He worked with Franz Fischer in developing a process to make motor fuel from carbon monoxide and hydrogen, and plants are now being built in Germany to operate this process.

Born Oct. 7, 1889, Dr. Tropsch was graduated in 1912 from the German Technische Hochschule in Prague, and received the doctor's degree from the same school in 1913.

From 1920 to 1928 he was associate director of the Kaiser Wilhelm Institute for coal research, in Mulheim-Ruhr.

In the latter year Dr. Tropsch was commissioned by the Czechoslovakian government to organize and head a national coal research institute in Prague.

He was director of that institute until 1931 when he came to this country to join the research staff of Universal Oil Products Company.

In addition to his work with Universal, he was also a professor of chemistry at the University of Chicago and at Armour Institute, Chicago.

I. C. C. Pipeline Investigation Report Now Being Written

A WASHINGTON, Oct. 14. PROPOSED report of the Interstate Commerce Commission on the investigation of reductions last year in pipeline rates and gathering charges is being prepared by Examiner Kelly, it was learned today.

On complaint of John E. Shatford, president of the Louisiana-Arkansas Refiners Ass'n., the Commission in June, 1934, inaugurated the pipeline investigation but meanwhile permitted the rates to go into effect. A hearing, based on answers by pipeline companies to a questionnaire sent out by the Commission, was held July 23 at the ICC.

Although widespread notice was given of the hearing and opportunity to question pipeline officials, less than 25 persons attended the hearing and few of them were oil men. Shatford was the only witness, and there was no cross-examination either of Shatford or of pipeline representatives present.

Commissioner Aitchison, presiding, proposed several questions that the Commission would consider, indicating that the scope of the inquiry might be broadened and the Commission seek information on its own account.

He said the pipeline inquiry is "on our own motion and we have the responsibility, of course, of developing facts, whether the parties do or not." He suggested that if it were found that pipeline earnings were "unduly high," the ICC might order a reduction or increase in rates. Any rate increase would be for the purpose of discouraging traffic, thus lowering pipeline income, according to Aitchison.

Interested parties were given 45 days to file briefs. The deadline has passed, with Shell Pipe Line Co. filing the only brief.

The Shell brief urged the commission not to consider testimony of Shatford, who appeared in the dual capacity of a representative of the refiners' association and an officer of the Transportation & Development Corp. which owns stock in major oil companies and railroads.

Shatford argued that the reduced pipeline rates would (1) give an additional advantage to northern refiners at the expense of field refiners and (2) have an adverse effect on income of the railroads.

The Shell brief stated that no railroads had protested the pipeline rate-reduction and that the ICC had no power to give or continue an "artificial economic advantage" to the Louisiana-Arkansas refiners. It said that Shatford answered one of his own arguments when he said that reducing pipeline rates would enable northern refiners to extend their tankcar shipments into territory of field refiners, meaning additional traffic for the railroads.

THE brief made capital of the fact that no shipper had appeared at the hearing or taken advantage of Commissioner Aitchison's implied invitation to submit complaints against pipeline rates and practices after the hearing closed.

It is "most significant," said the Shell brief, that even though the Commission as early as June 30, 1934, gave public notice to any person or potential shipper of the opportunity to present complaints, not a single shipper appeared to offer testimony or to present any complaint whatsoever.

The small attendance at the hearing was quite a surprise, as many oil companies, including independent marketers, had indicated interest and it was expected that they would appear and cross-examine pipeline officials. The ICC docket, besides many letters from oil companies, included requests from several oil associations asking information on the hearing and indicating that they might appear.

It will probably be some weeks before Examiner Kelly's proposed report is completed. The usual procedure is to make such reports public and permit the parties affected to file objections.

The ICC valuation survey of the pipelines is making slower headway than was first expected. It was expected that some of the tentative valuations would be ready for promulgation this fall. It now appears that none will be ready before the first of next year. Perhaps, final action on the pipeline rate case may be deferred until results of the valuation survey are available to the Commission.

I. C. C. Issues Forms Under New Law

WASHINGTON, Oct. 14.—Application forms for common carriers and contract carriers of property in interstate commerce, subject to the new motor carrier law, were made available today at the ICC. They must be filled out and returned to the Commission within 120 days after October 15.

Tariffs of common carriers (in operation June 1, 1935) and schedules of contract carriers (in operation July 1, 1935), under the "grandfather" clause must be filed with the ICC on or before Dec. 1, 1935, whether or not the certificate or permit has been applied for or issued by that date. Motor carriers which were not in operation on these dates must show "public convenience and necessity" for the service over the route proposed and file on a different kind of application form. Copies of appropriate application forms can be obtained by communicating with the Interstate Commerce Commission, Bureau of Motor Carriers, Washington, D. C. Drafting of regulations under the new bus-truck law has not been completed as yet.

CHICAGO — Derby Oil Co., Wichita, Kansas, is sending a miniature refinery through Nebraska to advertise its products.

The trip began at Humboldt, Neb., Sept. 30 and ends at Geneva, Neb., Nov. 4.

Supreme Court to Rule on Application Of Chain Tax to Exclusive Dealers

WASHINGTON, Oct. 14

THE United States Supreme Court will rule again on the West Virginia "chain-store" tax law, this time passing on the question of whether undivided dealer stations are subject to the tax.

In a decision last January (*Fox vs. Standard Oil Company of New Jersey*), the Supreme Court ruled that gasoline filling stations were "stores" under this statute and that the graduated tax was not unconstitutional. There was no definite ruling on whether or not undivided dealer stations were part of the "chain." (See NATIONAL PETROLEUM NEWS, Jan. 16, 1935, for text of decision.)

The Standard of New Jersey stipulated in submitting the previous case to the court that the lease and agency method of controlling dealers made them a part of its chain. Prior to prosecuting the suit the company had changed its lease and agency dealers to lease and license dealers to avoid the degree of control necessary to make the dealers "controlled" by the supplier and to escape the West Virginia tax.

A similar suit filed by Gulf Refining Co. also reached the Supreme Court and last April was sent back to the federal district court for a decision on whether certain undivided dealer stations were subject to the tax.

The district court held that Gulf's 568 stations known as "Authorized License Dealers" were "stores operated and controlled" by the oil company and that no injunction would be issued restraining Fred L. Fox, West Virginia tax commissioner, from collection of the "chain store" tax on such stations.

Gulf owns none of the ALD stations—either land or buildings, it is understood, although in some instances it owns the pumps, tanks and lubricating equipment. According to the arrangement, the dealer is giving the privilege of handling exclusively the company's products in his particular area and also has the privilege of participating in the company's customer charge account plan. The dealers purchase and own the products outright. In a few cases, the company has leased the station from a third party, it is understood.

THIS case is important because it may result in a definite ruling on the question of whether stations operated under certain exclusive-dealing arrangements are "controlled and operated" by the company so as to become part of the "chain." An affirmative ruling, subjecting such stations to the heavy tax on units in a "chain," might bring about drastic changes in the oil marketing setup in states with "chain-store" tax laws.

Root Refining Company's request that the Supreme Court hear its appeal in the patent infringement suit brought by Universal Oil Products Co. was not among the more than 300 cases acted upon by the court today. However, jurisdiction was taken by the court in several other cases involving the oil industry, and declined in other cases.

The court decided to hear the appeal of the State of Oklahoma from the Oklahoma Supreme Court ruling that the gross production tax on oil and gas produced in Osage County, Oklahoma, was invalid.

Cities Service Company's appeal from the California district court's ruling on the Richfield "reorganization" will not be heard by the Supreme Court.

The Court also denied the requested appeal of Holmes Hall in his suit for additional compensation as special master in the *Universal Oil Products-Standard Oil Co. of Indiana* suit some years ago. The lowest court awarded Hall $12,500 but the circuit court reversed this and ordered him to pay back $44,700 of the $99,900 he had already received. Today the Supreme Court topped this off with a rule requiring Hall to show cause why he should not be disbarred from practicing before the court for "conduct unbecoming a member of the bar" in the Universal-Indiana Standard case.

The Illinois motor fuel tax law was inferentially upheld when the court declined to hear an appeal by the Blue Rose Oil Co. from dissolution proceedings brought by the state attorney general on grounds that the company had allegedly abused its corporate powers by receiving two tank carloads of motor fuel, purchased from the Altitude Petroleum Co. and shipped from Overton, Texas, to Cicero, Ill., without securing a license.

Drops "Chain-Store" Tax Case

By Teletype

WASHINGTON, Oct. 15.—A request that the U. S. Supreme Court review the Michigan state Supreme Court's decision upholding validity of the "chain-store" tax law in that state has been dismissed by agreement of counsel. The Michigan "chain-store" tax specifically exempts gasoline filling stations and bulk plants.

The suit against the tax was brought by C. F. Smith Co.; Kroger; A. & P.; Woolworth and other "chains" against Orville E. Atwood, Michigan secretary of state, with the Standard Oil Co. (Indiana) and other oil companies and oil associations intervening as defendants. No reason was assigned when announcement of dropping the appeal was made in the Supreme Court, Oct. 14.

Protest Asphalt Ruling

LOS ANGELES, Oct. 11.—Strong protests have been forwarded by the Oil Producers Agency and other California organizations to Secretary of the Treasury Morgenthau against his action in approving the use of asphalt made from foreign crude oil on projects to be paid for with money allocated from the federal emergency relief funds.

THE

PANORAMA of PETROLEUM in the Mid-Continent

by

Lawrence E. Smith
N. P. N. Staff Writer

Glavis Back in the Saddle in East Texas . . . . . .

TULSA, Oct. 12

Predictions made last April, when Secretary Ickes created Federal Petroleum Agency No. 1, that his Louis R. Glavis division of investigation would regain control of federal regulatory efforts in East Texas have been borne out by events of the past week.

One Glavis investigator, C. L. Waterbury, has been appointed to the Federal Tender Board and Tom G. Kelliher, another Glavis agent, was given formal command of the investigators for the board. The other new member of the tender board, ex-Congressman James A. Frear, of Wisconsin, knowing nothing about oil, should have no fixed convictions as to what constitutes efficiency in running a tender board and should be able to get along well with the Glavis people.

The internecine warfare which has raged so long among the people who work under the Ickes management is one of the confusing things to voters and taxpayers who are accustomed to think of their government as an entity.

The sweeping change in the tender board was preceded by an investigation which resulted in suspension of two of the examiners. The two men suspended were former Glavis agents who leaped at the opportunity to be transferred a year ago to the tender board.

There will be a lot of firing right away and the non-Glavis men who work for the tender board or the affiliated examining agency are certain to be let out. It makes it a little tough on them for the public appearance of the thing is that they are dropped for cause, even though no charges have been filed. Incidentally, it is tough on Mr. Van Fleet who hasn't, so far as we can ascertain, been accused of anything but who has lost his position. He came into the field ignorant of oil but he worked at his job and tried to do all he could but he was doomed from the start and was behind the eight ball all the way.

Mr. Waterbury, new board member, is a relative of Mrs. Franklin D. Roosevelt. This oil job in East Texas seems to be a good spot for relatives. Ickes has a nephew down there and Elbert Burlew, one of the ranking officers in the Department of the Interior, also has a nephew, one of the Glavis contingent.

We venture one more prediction. Under the new set-up there will be a campaign of hell-raising with the major companies and an effort to find one of them running excess oil. Five barrels will be enough to make a headline.

Shakeup in the Personnel Of Texas Commission . . . .

The anticipated shake-up in the Texas Railroad Commission's East Texas personnel is under way, reports from there indicating that about 25 have have been let out since Capt. E. N. Stanley resumed the post of chief enforcement officer. One of his moves last week was the placing of W. L. Cain, member of the state tender board, in charge of records. Cain is an accountant.

Apparently a real effort is being made to meet the criticisms of the commission's system by the investigating committee of the state house of representatives. One of its complaints was that records were vague and inadequate. Another was that the attorney general's department and the commission forces work at cross-purposes. Last week a meeting was held in Kilgore, with the attorney general and the commission chairman present, and a move was made toward close harmony. Tom D. Rowell, assistant attorney general, is moving to Kilgore and will have offices with the commission forces.

Incidentally, the house of representatives, after heated debate, voted to give the investigating committee $10,000 so that it can continue its work. The committee had only $1000 to start with and divided this with an oil committee from the senate. The house committee plans to resume hearings soon.

Question Validity of Texas Confiscation Law . . . . . .

Numerous false starts have been made in Texas at contesting the constitutionality of the law providing for confiscation and sale of "hot" oil but it remained for the U. S. Department of Justice to get it before a court in such a way as to give the court an opportunity to say whether the law shall stand.

A few weeks ago the Federal Tender Board refused permission to McMurrey Refining Co. to ship 60,000 barrels of fuel oil in interstate commerce. This oil was part of a big batch of crude and products confiscated and sold by the state. The McMurrey company filed suit in federal court to compel the tender board to give approval, contending that the sale of the oil had removed the taint of illegality and that the federal board had no discretion in the matter, once the state had legalized the oil.

In its answer to this, the department of justice, legal representative of the tender board, contends the confiscation law is invalid and that the state court did not have authority in the first place to seize the oil.

Five truck drivers, charged with violation of the Connally law in that they transported gasoline from Texas to Louisiana without the required federal tenders, or permits, last week came before Judge Randolph Bryant, in federal court. Three were fined $150 each and given three months in jail and two were placed on probation. Four more are to appear soon.

Another form of federal activity is that of the internal revenue bureau. Tax liens amounting to several hundred thousand dollars have been filed against some 30 East Texas refiners and producers.

* * *

Of the hundred or more times that this writer saw Gen. Jacob F. Wolters, at proration hearings and in courtrooms, the most vivid recollection is that of the day in August, 1931, as the general stood before his tent near Kilgore, in the East Texas field. The then governor, Ross Sterling, had placed the field under martial law and "General Jake" had brought in his cavalry brigade of the Texas national guard.

He was attending to it that the boys performed in a manner that was properly military. For he was proud of that outfit. It was his hobby and his recreation and his enthusiasm was fully shared by all the officers and men under him.

Gen. Wolters died Oct. 8 in Austin and was buried last Thursday in Houston. He was 64 years old. As legislative representative he had represented The Texas Co. for many years, entering that work from law practice in Houston. He was recognized as an outstanding observer and played his part in obtaining the passage of proration laws in Texas.

Frequently he had to drop whatever he was doing for his employers and take his troops into some zone of riot and disturbance. He wrote a book on martial law from a legalistic standpoint. He never did agree with the federal court which held that the martial law declaration in East Texas was outside the governor's authority.

The Texas house, in special session at the time of the general's death, adopted a memorial resolution and adjourned for the day in his honor.

Attempt to Halt Wide Margins by New Cut in California Gasoline

By Jack N. Westsmith
N. P. N. Staff Writer

LOS ANGELES, Oct. 11

DIFFERENCE between major California oil companies regarding marketing policies were responsible for the reduction Oct. 9 of 1 cent a gallon in wholesale and retail prices of all grades of gasoline in the Los Angeles Basin area. The cut was initiated by Shell Oil Co. and Union Oil Co. and followed by other majors the next day.

This action by Shell and Union, who also initiated similar cuts on Sept. 25, was prompted by a determination to bring prices of refined products down to their actual existing level, as compared with the nominal prices maintained by some major company affiliates.

THE practice of these affiliates has been to offer dealers a wide margin below posted retail prices. Margins were reported as high as 6, 6 and 5 cents a gallon below the respective retail prices of Ethyl, standard and third grade brands. By these reductions in retail prices, Shell and Union have forced the companies to cancel the wide-margin contracts or have their net-back at the refinery greatly reduced.

This renewal of the internal conflict on secondary companies accentuated the difficult situation caused by continued disagreement between members of the major group in regard to crude production policies.

Reports were current that some of the major companies were ready to abandon their marketing affiliates altogether or to absorb them into the parent organization. Attempts in the past to achieve similar results have failed for various reasons, chiefly because of asserted contractual obligations that prevented parent organizations from exercising the necessary control over the marketing operations of their affiliates.

Serious loss of gasoline gallonage by some majors, through the competitive tactics of the marketing affiliates of their rivals, appeared to have brought matters to a crisis. Indications are that the period of compromise has ended and that some drastic change is inevitable.

In the meantime, Pacific Coast markets continued in a chaotic condition, with only nominal prices prevailing also in crude and refined markets.

Independent refiners generally filled their crude storage tanks to capacity in anticipation of early restoration of crude prices, following the cut on Aug. 29, and also piled up stocks of refined products. Instead of making the expected profit on their crude purchases and receiving advanced prices for their gasoline, they find themselves faced with the alternative of meeting competitive prices and operating at a loss, or of closing down their plants until prices are restored to profitable levels. Many are closing, while others were operating on a part-time schedule.

Retail prices in the Los Angeles Basin area have been reduced to the lowest level since the present price war began in June. Notwithstanding the attempts of major companies to prevent the sale of their products at less than their own posted prices, in many instances their standard brands were being offered at independent service stations at a discount of 1 cent a gallon.

As the week closed, at major company owned and controlled service stations in the Basin area, third grade brands were uniformly posted at 10.5 cents a gallon, inclusive of 4 cents tax,

standard brands at 11.5 cents and Ethyl at 13.5 cents. Independent competitive brands in the same area were retailed at prices ranging from 9.9 to 8.9 cents a gallon with a few at still lower figures.

Crude production of the state continued to exceed the 590,700-barrel quota established by the independent producers' committee. The output Oct. 7 was 645,620 barrels and Oct. 8, 644,575 barrels. Kettleman Hills North Dome, with an allotment of 61,750 barrels, consistently produced from 92,000 to 95,000 barrels daily.

Major oil companies refused to disclose their plans in regard to the crude situation or to reply to the criticism by the independent producers, of the price cut made on Aug. 29. Unofficially, their attitude appeared to be that no readjustment of crude prices could be made until the output of the state had been brought down at least to the quota fixed by the independent group. They were reported to be divided in opinion as to whether, regardless of output, any change in crude prices should be made until sales of refined products had been brought to profitable levels.

National Emblem Planned By Grease Makers

By Teletype

CHICAO, Oct. 15.—Reports of directors and committees of the National Association of Grease Manufacturers took up the morning session of the first day of the third annual convention of the association at the Stevens Hotel, Chicago, October 14.

A national emblem for grease, patterned after the Pennsylvania Grade Crude Oil Association emblem also was discussed.

Addresses and discussions occupied most of the afternoon session of the first day, with M. B. Chittick, Pure Oil Co., and association president, presiding, following by the annual banquet.

Mr. F. E. Huggins, Jr., Sower Manufacturing Co., Buffalo, N. Y., addressed the group on "Modern Methods of Grease Manufacture," while "Antifriction Bearing Lubrication" was the subject of a talk by C. R. Ahlberg, chemist, Marlin-Rockwell Corp., Plainville, Conn.

Wm. H. Saunders, Jr., vice-president of the association, presided at the second and final day of the meeting. The morning session was devoted to addresses on "Practical Tests for Industrial Greases" by H. A. McConville, General Electric Co., Schenectady, N. Y., and "Grease — Past, Present and Future" by A. R. Lang, Swan-Finch Oil Corp., New York.

The afternoon session was devoted to an address, "Safeguarding the Investment," by J. Howard Pile, Chek-Chart Corp., Chicago.

E. C. Lufkin, Former Head Of Texas Co. Dies

NEW YORK, Oct. 10. — Elgood C. Lufkin, former president and chairman of The Texas Co., died at his home in Rye, N. Y. last night. He was 71 years old.

Mr. Lufkin spent most of his boyhood around Titusville, Pa. where his father operated in the oil fields. He was graduated from the Massachusetts Institute of Technology in 1886 as a mechanical engineer and in 1889 joined the Indiana Pipe Line Co. as chief engineer.

Mr. Lufkin joined The Texas Co. in 1909, as a vice-president and director. He first made his headquarters at Houston, Texas but later moved to New York. In 1913 Mr. Lufkin was elected president of the company and served in that capacity until 1920, when he was made chairman of the board. He resigned as chairman of the board in 1926, due to failing health, but continued as a director of the company until 1931.

Mr. Lufkin served as vice-chairman of the Petroleum War Service Board during the World War. He was a director of several banks and trust companies.

He is survived by his widow and three children.

Export Gasoline Prices Continue to Rise

By Teletype

NEW YORK, Oct. 15.—Export markets continued an outstanding source of interest to oil men as foreign buyers still were taking an interest in the American market and export gasoline prices were fully 0.5 cent higher than a week ago.

The last export sale of 64-66, 375 e.p. gasoline which was revealed Oct. 14, was at 5.375 cents f.o.b. the Gulf, compared to one on Oct. 8 at 4.875 cents.

Two French buyers were in the market today for cargoes of gasoline for November lifting.

Officials of the Standard Oil Co. of New Jersey declined to comment on reports that the company was negotiating with the Russian Government to obtain all of Russia's export output of petroleum products. Reports were that the Jersey Standard, Royal Dutch-Shell and Anglo-Iranian Oil Co., would each take a part of the Russian output in an attempt to stabilize world oil markets. Similar negotiations were carried on in 1932 but were dropped when satisfactory terms could not be reached.

There were also reports that the same three companies were negotiating for the purchase of the Standard Oil Co. of California's crude oil production on the island of Bahrein, in the Persian Gulf, but confirmation was unobtainable.

Patent Probe Starts

NEW YORK, Oct. 14.—Hearings by the committee of the House of Representatives investigating patent pools and agreements covering plural ownership of patents, will start Oct. 15.

The hearings will be conducted at the Fifth Avenue Hotel, New York. Congressman Sirovich, New York, is chairman of the committee.

Definite information regarding the start of hearings on the oil industry could not be obtained. Several other industries will be covered first and it may be a month before the oil industry is reached, it was stated.

Interstate Compact Commission Appoints Committees to Study Conservation

By Allen S. James
N. P. N. Staff Writer

OKLAHOMA CITY, Oct. 11 ANOTHER step in its study of conservation of the petroleum reserves of the nation has been taken by the Interstate Oil Compact Commission.

This was accomplished at the commission's second formal meeting, at Oklahoma City Oct. 11. Governor Marland, of Oklahoma, was chairman. No other governor of the member states was present, although each was duly represented. Michigan was the only non-member state having an official observer.

The commission adopted by-laws, approved a report of the Committee on Co-ordination of the Police Powers of Member States, passed one resolution which recommended use of the Bureau of Mines' monthly market demand estimate figures "for the present." It extended invitations to states which have delayed in ratifying the compact to send representatives or "observers" who would be granted the privileges of the floor at future meetings.

Report of the Committee on Co-ordination called for the creation of four permanent committees. They are:

1. Committee on Conservation—to make a study of the most improved methods of conservation of oil and gas resources. The chairmanship of this committee was given to the Kansas member, with other committeemen being from New Mexico and Oklahoma.

2. Committee on Co-ordination—the duties to be (a) to ascertain the aggregate potential production of either oil or gas in member states and the percentage of potential production being produced; (b) report as often as the commission directs, on estimates of proven petroleum reserves, and (c) recommends plans whereby producing ability of wells may be more accurately and uniformly estimated, with a view to having incorrect estimates of well potentials eliminated. The Texas member heads this committee, but its membership includes the other five on the Commission.

3. Committee on Consumption—which will report on methods to be used in determining the current cosumption and demand. Chairmanship was given to the New Mexico member, with those of Texas and Colorado completing the personnel.

4. Committee on Imports and Exports—which is to make a study of the question of imports and exports, and to make reports and recommendations thereon at regular meetings.

The Illinois representative heads this "Imports and Exports Committee," the Texas and Colorado members completing the roster.

Chairman Marland precipitated considerable discussion over Sect. 3 of Art. V, which reads, in part, that "The certificate of the Bureau of Mines of the U. S. shall be prima facie evidence of the daily average production of each Compacting State during the preceding calendar half year. . . ."

The chairman visioned the not far distant time when the commission would want its own fact-finding body, or "guessing body" as he called it, for determination of states' resources. The commission, he pointed out, is pledged to study conservation and he thought it would want an engineering staff as well as a technical staff "to teach us conservation."

Hiram M. Dow, representative of the governor of New Mexico, added that he did not want to close the door to setting up a fact-finding body, but Col. E. O. Thompson of Texas terminated the discussion by declaring that he could see no reason why the states could not use the technical and engineering staffs they already have set up. "We have within our grasp the best staff that can be assembled in America, and we might as well make use of it," he said.

It then was decided that the states shall furnish the commission's secretary with all factual data required, this information to be re-distributed to all other commission members.

William R. Boyd, executive vice-president of the American Petroleum Institute, was a visitor, and was called upon by Chairman Marland for a talk.

Tom Anglin, who is alternate for Governor Marland, read into the records figures designed to show that all member states had stayed within their production allocations for four weeks ended Aug. 31, 1935, whereas, with the exception of Arkansas, all non-member producing states had exceeded the Bureau of Mines' recommendations.

The Commission will meet again Dec. 13.

Heads Export Department

NEW YORK, Oct. 8.—H. M. Herron has been appointed general manager of the export department of The Texas Corp., succeeding T. Rieber, who was recently made chairman of the Board of Directors. Mr. Herron formerly was assistant manager of the department.

A. E. Thayer was appointed assistant manager of the export department and W. H. Borie and C. M. Claeys were made managers of the South American and European divisions respectively.

E. W. Shaw Dies

TULSA—News of the death of Eugene Wesley Shaw, prominent geologist, has been received in Tulsa. He was 54 years old. He was for 12 years a member of the U. S. Geological Survey and in recent years had been in foreign service for oil companies. Ill health compelled him to retire about two years ago.

"Polly" Gasoline Comes from Crackers

To the Editor:

I suppose you have noticed that autumn styles in gasoline are on display all over the place. All our filling stations in Gray Horse and vicinity have broken out in a regular eczema of placards and billboards, explaining to the public how the gas on sale is either derived from or has the vigor of some kind of animal. The fauna range from the blood-sweating behemoth of Holy Writ to canary birds.

This, it seems to me, is contrary to the teachings of our leaders in Washington who have recently passed a law saying that we have to stay out of war until next February. Our oil companies can do much to soothe the national mind and implant the doctrine of peace by choosing as trade mark or emblem something less bellicose than the carnivora. The constant sight of pictures of lions, tigers, dinosauers and even parrots now flaunted before the eyes has already had its effect upon the young men of my neighborhood and the town marshal reports that he has put down more fights since the new filling stations signs went up than he had in a year and Gray Horse was never known as a pacifist community at any time.

This form of advertising may be necessary to get the business, but I doubt it. I have been motoring since the days when we cranked them from the side. Until a few years ago we gave little thought to the gasoline. A kettle of hot water and a couple of well-aimed kicks at the radiator took care of our starting problems even in the coldest weather, with no difficulty at all except an occasional broken toe. We had many problems that ranked ahead of gasoline, such as how to keep water in the radiator, remembering which hind wheel to jack up when the hot water and the punting failed to get the four cylinders to take off at the same time.

We didn't bother about whether the gasoline was stabilized or made by Hickey-Freeman & Co. If you had said "stabilized" to us then we would have thought you referred to the sleeping quarters for our horses, which were then quite plentiful and not merely something to haul around in trailers to the county fairs along with the pickled peaches and the biggest watermelon ever raised in Pawnee county.

All we asked of our gasoline was that it arrive in the cylinder just ahead of the spark. It was expected to carbon up a little, as that gave us a reason for buying that valve grinding outfit which was so much fun to tinker with. If we had heard the word octane we would have assumed it had something to do with music lessons or, maybe, was the name of the wife of an early Roman emperor.

But now we have all these things and a hundred more and public interest in the matter runs the gamut from indifference to apathy. Most of the excitement is still confined to the sales managers.

One company says its gasoline is fresh and another says there is no sulfur or cyanide or something in its product. This new psittacosis gasoline now on sale in Gray Horse is guaranteed to make your engine snarl more savagely than ever before. They call it "Polly" gasoline because it is the product of a cracker. There is another company that saves gasoline by the cupful and I was going to try some of this but my wife said she had barely enough cups to set the table with and none to store gasoline in. Then there is another brand that is the pure essence of tigers and other varmints that roam the forest.

The only real opportunity for sloganeering that has been neglected is in East Texas. I have long thought that filling stations handling the product of many of the refineries down there should put up a sign saying, "Get It While It's Hot."

To return to my first theme: Let us work together for peace. Let us cease this flaunting of brute courage and forest ferocity. Let us, for instance, switch to trademarks that soothe and tranquilize rather than infuriate and inflame. Trademarks that fall softly upon the esthetic senses, such as, "Morning Glory Gas—Peaceful Hours;" or "Siesta Fuel—it Satisfies the Soul." The possibilities are infinite and at my usual fee I shall be glad to suggest other slogans.

Ellick Botts, Consulting Pumper
Gray Horse, Okla.

Sightseeing Made Easy

"The 'Caravan' reaches Pueblo, Colo., at 10:30 A.M., Thursday, Nov. 7, and here opportunity will be given for inspection of the Grand Canyon."
—From American Petroleum Institute announcement of special train to Los Angeles convention.

The special leaves New York on Nov. 5, reaching Pittsburgh, Pa., the following day. At the latter point the delegates will have a few minutes to stretch

their legs and view Niagara Falls.

With a little assistance from the darky in the white coat in the club car, one should be able to see the East Texas field as the train leaves St. Louis. The field is southwest of this town and on a clear day will stand out in bold relief against the skyline of El Paso, also to the southwest of St. Louis. That rugged pinnacle a little north of southwest will be "Alfalfa Bill" Murray, now tilling the soil in southeast Oklahoma.

Pushing the buzzer again for the club car attendant we next approach Kansas City where we look to the left and see the Alamo. A little beyond this stop is William Allen White and that roaring sound that is heard is the presidential boom of Alf Landon.

By special arrangement with the copyright owners and under order of a three-judge court, arrangements have been made to have Glacier Park on display just outside Manhattan, Kans. (It will be necessary to summon "George" two or three times more to get a full view of this phenomenon.)

The special treat of the trip, though, is reserved for the stop at Pueblo, as has been officially announced by the A.P.I. At this point, just across the Continental Divide and 450 miles away, lies the Grand Canyon.

To Build New Terminal

LONDON, Oct. 8.—Washaven Oil Wharves has been organized to construct an oil storage plant on the Lincolnshire side of the Wash, near Boston, England. The initial capital is approximately $1,250,000.

The site has the advantage that vessels can load and unload there at all times. Those concerned with the company believe that they will be able to ship oil through the inland waterways to the midlands of Britain at a cost price below that at which it can be moved from existing storage accommodation.

New German Oilfields Discovered

LONDON—Three new oilfields have recently been discovered in Germany, according to an announcement by Professor Bentz, head of the Prussian Geological Department.

Federal Court Holds Mixing Illegal And Legal Oil Makes All Illegal

TULSA, Oct. 12

THE theory that commingling of legal and illegal oil renders the entire mixture illegal was upheld Oct. 9 in a formal opinion filed by Federal Judge Randolph Bryant, of the eastern district of Texas.

Judge Bryant also held that the burden of proof lies on the applicant for a tender to show that the oil he proposes to ship was legally produced.

The opinion also upheld the constitutionality of the Connally law but this is not news, since the court Sept. 7 denied application of the East Texas Refining Co. for an injunction against Federal Tender Board No. 1. In this application the Connally law had been alleged to be unconstitutional.

Highly important are the court's pronouncements as to the commingling of legal and illegal oil and the indivisibility of the product into legal and illegal products and the declaration that the burden of proof as to whether oil is legal is upon the applicant for permit.

Said the court, in its conclusions of law:

"I find that the Act of Feb. 22, 1935, Public No. 14, 74th Congress, known as the Connally Act, is valid and that the purpose of said act was and is to prohibit the shipment or transportation in interstate or foreign commerce of petroleum which, or any constituent part of which, was produced, transported or withdrawn from storage in violation of state laws or valid orders and regulations of state regulatory bodies, and of any of the products of such petroleum.

"That the decree entered on April 5, 1935, in the case of Ocean Petroleum Co. v. Railroad Commission of Texas, equity case No. 836, in the United States district court for the eastern district of Texas, Tyler division, did not involve or determine the legality of the fuel oil there in question, within the meaning of the definition of contraband oil contained in Sec. 2 (1) of the Connally Act.

"That the state tender No. 1021-4 issued by the Railroad Commission of Texas, pursuant to the decree in the aforesaid case, did not establish the legality of said fuel oil within the meaning of the definition of contraband oil contained in said act, and is not conclusive or binding upon Federal Tender Board No. 1.

"That the said fuel oil, from which the gasoline here in question was in part processed, was contraband oil within the meaning of the Connally act.

"That the commingled mixture, composed of said fuel oil and said crude petroleum, constituted contraband oil within the meaning of the Connally act. And that the gasoline processed from said mixture, including the 10,000 barrels here in question, is likewise contraband oil within the meaning of said act.

"That the burden of proof to show that the petroleum or products thereof, for which a federal tender is applied, is eligible for shipment or transportation in interstate commerce is upon the applicant for such tender.

"That the finding of the Federal Tender Board No. 1, as to the facts, being supported by evidence, is conclusive."

Daily Average Production, Important Districts, American Petroleum Institute Figures

	Week Ended Oct. 12	Oct. 5
	Barrels	Barrels
Okla. City	154,850	131,600
Total Okla.	516,600	475,450
East Texas	425,950	424,650
Total Texas	1,021,500	1,019,700
California	642,200	627,500
East of Rockies	2,139,550	2,092,100
Total U. S.	2,781,750	2,719,600
Crude Imports	81,570	80,860
Total New Supply	2,863,320	2,800,460

Aluminum Stearate Grease Quality Depends On Exact Manufacturing Control

(Presented before Third Annual Meeting of Lubricating Grease Manufacturers Association, Chicago, Oct. 14-15, 1935).

By James McKee*

IN ADDITION to the demand for larger quantities of lubricants for the larger number of machines, now we have the call for a large number of highly specialized lubricants, each to serve a specific purpose. One manufacturer makes as many as three hundred different ones. Over and above this, customer appeal and service have been cultivated. Today, a grease maker's responsibility does not stop when his product leaves his factory. On the contrary, he is responsible for its performance, sometimes where it was not intended. The modern greasemaker is obliged to find out the preference of the customer and to produce suitable products. To meet these requirements, research has been directed into new channels. Metallic soaps, Naphthenic Acids and extreme pressure lubricant bases have received special attention.

Aluminum Stearate Type of Grease

One of the chief items which has demanded the attention of grease makers has been the production of Aluminum Stearate greases. This type of greases has the advantage of crystal transparency and customer appeal, relatively high temperature resistance, stability, waterproofness, and the possibility of wide application in a variety of lubrication problems.

The original introduction of aluminum soaps for lubricants seems to have been lost in the dark past of the grease maker's art. They are mentioned by I. I. Redwood (1) as early as 1898, when their reputation was as bad as that of petroleum oils themselves a half century earlier. However, when their value in non-chatter oils was proved, grease makers again took up the study of this material. As a result of a campaign by metallic soap manufacturers, aluminum stearate began to be used as a base for cup greases. This led to a variety of results, each representing the resources and ingenuity of the investigators. In 1927 Klemgard (2) described a test for aluminum stearate to determine its value as a grease base.

With a few exceptions, and then only after being pressed by their own sales departments, grease makers have been reluctant to produce greases from this material. This attitude is not surprising. Investigators were hampered by the total nonexistence of published data.

In 1931, Zublin announced that aluminum soap greases were most desirable for rocker arm lubrication. (3) This was followed in 1932 by Kopp's directions on the manufacture of Lucid Compounds. (4) A year later, the present writer (5) called attention to the fact that the consistency of aluminum stearate greases depends on:

(a) quantity and quality of the stearate

(b) viscosity of the petroleum oil used

(c) rate of cooling of the hot grease discharged from the kettle.

The use of aluminum soaps has grown tremendously as indicated by the increase in the sales of this product for grease making. In addition, words of encouragement are beginning to find their way into the literature. H. S. Garlick (6) in his masterly paper on "Lubricating Greases" delivered before the Institution of Petroleum Technologists in England says, "As ingredients in grease manufacture, aluminum soaps are gaining in popularity now that intensive study has revealed the best means of their utilization. One of the main objects in the renewed study of aluminum soap products has been the desire for an all-purpose automotive grease" In this country, C. C. Wilch, (7) speaking before the Louisiana-Arkansas Refiners' Association stated, "Aluminum soap greases compare closely in structure and lubricating adaptability to calcium soap greases."

Due to the lack of data, each investigator has had to develop his own technique which would apply to the inherent conditions of his manufacturing equipment. Whenever possible the stearate manufacturers have cooperated with the grease maker to the end that the sales of both aluminum soaps and greases made from them have shown a healthy growth.

It is believed, by this time, enough experience has been obtained to set down certain very general rules which may serve as adequate guides to those who still have difficulty in the manufacture of this type of greases. These general rules may also serve as a basis for discussion and the foundation for future development.

For this purpose greases were prepared from the same lot of aluminum stearate and oils from various sources and different viscosities to show the effect of the Petroleum oil on the consistency. Then, assuming that a 300# viscosity of 100 F. asphalt oil was most economically desirable, several series of greases were prepared to show:

(a) the effect of the rate of cooling

*Condensed from paper, "Aluminum Stearate Lubricants", prepared by Dr. McKee shortly before his death on Sept. 15. The paper was presented by Francis J. Licata, who was associated with Dr. McKee on the technical staff of the Sun Oil Co.

(b) the effect of moisture and time of compounding

(c) the effect of repeated working of this type of grease.

General Procedure

50 grams of aluminum stearate were thoroughly mixed with 450 grams of oil, while cold, in a one liter Monel metal beaker. Then this was placed into a pot containing oil to serve as an oil bath. Heat was applied by means of small electric hot plate, and agitation was furnished mechanically by a stirrer attached to a small drill press driven at 120 r.p.m. When the temperature reached 150 C, (302 F.) the grease was transferred into one pound tin cans, having a 3-inch diameter and 4.5 inches high, and immediately placed in a Freas drying oven at 105 C, (221 F.), from which the current was then shut off to give a constant rate of cooling. Unworked and worked consistencies were determined, according to the A. S. T. M. procedure.

Variations in the procedure to bring about a special effect will be described later, whenever they occur.

Effect of Petroleum Oil

In order to compare the effect of paraffin, naphthenic and asphalt oils on grease consistency, we obtained, through Fiske Bros. Inc., four oils from each group having approximately similar viscosities at 100 F. Samples of grease were made from each oil according to the general procedure described above, and A. S. T. M. penetrations determined several days after reaching room temperature. One determination was made in the tin cans for the unworked penetration while an average of two or three observations was taken for the worked consistency. Most samples showed check determinations within 4 points. Table 1 shows the data obtained.

It will be seen that greases made from paraffin or Pennsylvania oils show greater penetration or softness as the viscosity of the oil rises. On the other hand, the penetration readings indicate very little change in the greases made from various asphalt oils. The graphs showing the penetration in greases made from naphthenic oils show an anomalous behavior. Up to the 1000 viscosity oil, the greases seem to behave similar to the paraffin oils in that they get softer as the viscosity rises. However, the penetration of the grease made from the 2000 viscosity oil was almost as low as that made from the 100 viscosity oil. This observation led to the discovery of the fact that the presence of moisture and the time of compounding also affect the consistency of aluminum stearate greases. This will be discussed later in greater detail under the "Effect of Moisture and Time of Compounding."

Effect of the Rate of Cooling

One of the chief sources of variation in grease consistency is the rate of cooling. This is easily realized when, by the use of the same formula, a small laboratory batch of a few ounces will cool in a short time to a hard, brittle, granular mass, not at all like a grease, while a large batch, made in the factory will cool very slowly to a soft, smooth, unctuous, and somewhat adhesive grease. To show the relatively large effect of the rate of cooling, samples similar to J were prepared by heating to 150 C. (302 F.), and cooling to room temperature 25 C. (77 F.), at various rates.

Sample M was cooled within 3 hours by passing cold water around the tin container. Sample N was cooled within 12 hours in the oven as described in the general procedure. Samples O and P were made to cool within 18 to 25 hours respectively by various thicknesses of asbestos insulation. Table 2 shows the data and graphs of the results obtained.

It is clear that by using the same formula, the rate of cooling will affect the worked A. S. T. M. penetrations from 193 to 267 — a difference of 74 points. Moreover, the whole general appearance of the greases was different. Sample M showed excessive bleeding or oil separation. With slight pressure it crumbled between the fingers into a coarse, dry looking powder. Subsequent samples showed increasing softness, smoothness

Table 1

Effect of Oil on A. S. T. M. Grease Consistency

Sample	Oil Viscosity at 100 F.	Unworked Penetration	Worked Penetration	Remarks
A	153—Paraffin	168	256	Smooth, no bleeding
B	310—Paraffin	178	287	Smooth, no bleeding
C	1050—Paraffin	193	340	Smooth, no bleeding
D	2300—Paraffin	192	370	Smooth, no bleeding
E	100—Naphthenic	152	223	Firm, slight bleeding
F	320—Naphthenic	155	246	Smooth, no bleeding
G	1040—Naphthenic	169	275	Smooth, no bleeding
H	2000—Naphthenic	120	230	Smooth, no bleeding
I	100—Asphalt	170	234	Granular, bleeding
J	310—Asphalt	153	231	Smooth, no bleeding
K	1040—Asphalt	145	234	Smooth, no bleeding
L	2000—Asphalt	144	248	Smooth, no bleeding

Table 2

Effect of Rate of Cooling on Greases

Sample	Time of Cooling	Worked Penetrations	Remarks
M	2 hours	193	Granular, excess bleeding
N	12 hours	225	Smooth, no bleeding
O	18 hours	238	Smooth, no bleeding
P	25 hours	267	Smooth, no bleeding

Table 3

Effect of Moisture and Time of Compounding

Sample	Hours held at 150° C.	Worked Penetration	% Moisture In Grease
Q	0	275	0.15
R	1	240	0.12
S	3	225	0.10
T	6	222	0.05

and a degree of unctuousness as the grease was made to cool more slowly.

Effect of Moisture and Time of Compounding

The anomalous behavior of Sample H, made from the 2000 viscosity Naphthenic oil, led to the discovery of the fact that this sample had been held at 150 C. (302 F.), several hours longer than others. During this period there was the possibility of finer stearate dispersion into the oil, and the loss of moisture held captive in the grease. Moisture determination on samples G and H revealed 1.2 and 0.7 per cent respectively. It is common knowledge that even in this type of greases, the presence of moisture affects the consistency. Hence it seemed desirable to make several observations on this phase of grease making.

A series of greases were made similar to sample J with 10 per cent aluminum stearate in the 310 asphalt oil and heating to 150 C. (302 F.). However, the general procedure described above was modified so that the samples were mixed at 150 C from zero, one, three, and six hours and then placed in the oven to cool as usual.

The penetrations on the resulting greases showed an increasing hardness as the time of compounding increased and the moisture contents decreased.

The data is recorded in Table 3.

Miscellaneous Properties of Aluminum Stearate Greases

(a) — Consistency — Greases of this type are ordinarily regarded with awe because of their reputed great changes in consistency. This fear is based on the fact that stearate type of grease is sold on an unworked basis, while the consumer is interested in its worked consistency. All greases become softer on working. Therefore, a large percentage of complaints will be eliminated as soon as aluminum stearate greases are sold on a worked basis. It may be of interest to record that sample J, with a worked penetration of 231, changed only to 250 with sixty additional strokes of the grease worker and seemed to reach a maximum of 255 with sixty more strokes, bringing the total up to 180.

(b) — Waterproofers — Another wrong notion about aluminum stearate greases is the statement sometimes made that they hydrolyze in the presence of water. It is impossible to find the origin or the cause of this misleading idea. An easy way to show that water has no effect is to boil some aluminum stearate grease in water. Then, by pouring off the excess and boiling out the remaining water, the grease is found to be still as solid and transparent as before the test.

(c) — Wide Applicability — One of the happiest features of aluminum stearate greases is the knowledge that, with proper modification, they may be compounded to obtain an infinite variety of products. The aluminum stearate can itself be changed to have a low or high bodying effect on the oils used. Various grades are sold under trade names for that purpose. Fluxes can be added to the stearate and oil so that the resulting product may be thickened oil, a stringy adhesive semi-fluid grease, or a high melting solid lubricant.

In this connection, it is well to warn the inexperienced that as little as 5 per cent soda or lime grease will liquefy an aluminum stearate grease. Therefore, the necessity for absolute cleanliness.

Conclusions

In the above, an attempt was made to show that aluminum stearate greases are in line with the requirements of mechanical and lubricating development.

In some cases, due to their customer appeal, heat resistance and stability aluminum stearate greases are the only ones that can be used.

Data has been presented to show that the grease maker can modify the properties of aluminum stearate greases by control over:

(a) Viscosity and type of oil.

(b) Rate of cooling.

(c) Time of compounding and moisture content.

(d) Use of Fluxes. In this case it is often advisable to use ready made bases which are designed to give definite desirable results.

In general, it has been pointed out that the sales of aluminum stearate greases are increasing and that profitable returns lie before those who are willing to engage in a little patient investigation.

Acknowledgements

The writer is greatly indebted to Mr. Joseph Nothum for the preparation of the samples and Mr. G. E. Merkle, of the Fiske Bros. Refining Co. for valuable advice.

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7. Composition, Properties and Uses of Modern Lubricating Greases—C. C. Wilch — NATIONAL PETROLEUM NEWS— page 28 — Sept. 5, 1934.

Speaks on Polymerization

CHICAGO, Oct. 11.—Geo B. Murphy, manager of the research and development laboratories of Universal Oil Products Co., addressed the Institute of Chemical Engineers here, Oct. 9, on "Catalytic Polymerization as a Means of Producing Motor Fuel."

From the laboratory stage, where two cubic feet of cracked gases were processed, he traced the development of the process up to the present large-scale commercial installations, which are producing polymer gasoline at the rate of five gallons or more per 1000 cubic feet.

Parsons Moves Offices

CHICAGO, Oct. 7.—The main office of Ralph M. Parsons Co. has been moved from Mt. Vernon, Ohio, headquarters for the past year, to 310 South Michigan Ave., Chicago.

Los Angeles is not the only point of interest for the visitor from the oil industry interested in marketing. San Francisco is an entirely different type of city with many unusual designs in service stations. This new station of the Shell Oil Co. at Palo Alto, near San Francisco, is opposite the campus of Stanford University and the usual style of architecture of the company was departed from to allow this station to conform to the Romanesque style of the university buildings. The station building is of cut stone and brick

Oil Men at Los Angeles A.P.I. Meeting Will Benefit by Having Cars

LOS ANGELES, Oct. 10

OIL men who expect to attend the annual meeting of the American Petroleum Institute at Los Angeles, Nov. 11 to 14, should plan to drive there. They will find a motoring trip thoroughly enjoyable, and also valuable from a business standpoint.

Accessible highways, in excellent condition at all seasons of the year, lead to the west coast from the Atlantic seaboard, the south, the north and the middle west.

The hazards of long distance motor travel have been eliminated and the former sandy desert stretches, narrow hairpin turns, or uninteresting stretches of sparsely inhabited highway no longer exist. Communities have been built up along these national highways so that the motorist is never far from supplies of gasoline, lubricating oil and other traveling accessories and conveniences.

There are stores and service stations at convenient intervals. The routes are well marked by federal, state and municipal authorities, or by automobile organizations. Maps, weather information, data on road conditions and other assistance to the motorist is provided by a number of oil companies. Hotel and camp accommodations of a high class character are conveniently located at frequent intervals.

Special emphasis should be placed on the experience to be gained by an oil man on such a trip. He will have the opportunity to become acquainted at first hand with the marketing methods of many oil companies in the territory he covers.

Various routes from the eastern part of the country provide a wide choice that should meet all preferences in regard to scenic and other attractions in making the trip from other parts of the country to Los Angeles. At this season of the year, the northerly trails are preferred for the westward trip and the southerly highways for the return.

After their arrival in Los Angeles, oil men will find possession of a car a very great advantage. All points of interest, including those connected with the oil industry, are easily and conveniently reached by excellent highways. In many instances, driving is the only practicable means of approach as the areas to be visited are often far from any railroad service. For quick access to oil fields, refineries, natural gasoline plants, bulk plants and service stations in wide variety an automobile is indispensible.

Los Angeles, and to some extent the whole of southern California, is "dolling up" in preparation for the institute meeting. So far as major companies are concerned, good housekeeping is characteristic of operations in all branches but, at the present time, special efforts are being made to create a favorable impression on the visitors. Oil field properties, tank farms, refineries and bulk plants are not being neglected but chief attention is being paid to the marketing departments. The numerous service stations that line all highways offer favorable opportunities for this beautifying effort.

The principal oil companies in California have long been leaders in the movement to combine beauty with utility in service station design. They have gradually eliminated the old, inconvenient and unsightly stations and have erected in their place units that in plan and elevation are an asset to the community. Most of these

improved units are in or near the large consuming areas but, because of the desire to build stations that conform to their surroundings, some of the most noteworthy examples of advanced design are in outlying areas. Some are best seen at night, because of their brilliant lighting effect.

Approximately 4000 service stations and garages selling gasoline and oil are now being operated in the Los Angeles City district, with an equal number scattered throughout the area immediately surrounding it. The visiting oil man who is interested in or engaged in marketing could profitably spend a few days in a motor tour of inspection, covering a selection from several hundred stations that have been designed to fit special surroundings.

Carefully planned group tours will be arranged by the institute committees covering general points of interest, but these cannot provide for the special needs and interests of oil men who are chiefly concerned with some particular phase of the industry's operations. To take full advantage of the opportunities offered, such men will find their task greatly simplified if they have their own car.

Improved highways traverse the California oil-field territory and give access to the surrounding mountain resorts, desert country, ocean beaches, and agricultural areas.

Gasoline Men Invited

NEW YORK, Oct. 12.—Oil men who are attending the American Petroleum Institute's 16th annual meeting in Los Angeles on Nov. 11 to 14, have been extended an invitation to attend the fall meeting of the California Natural Gasoline Association, to be held in the Los Angeles Biltmore on Nov. 11.

Speakers at the natural gasoline meeting will include Dr. Gustav Egloff, Universal Oil Products Co., who will discuss "Making High Octane Gasolines from Propanes and Butanes," Dr. George Brown, University of Michigan, who will discuss means of rectifying straight-run gasoline, and T. L. Taggert, president of the association.

Panhandle Gas Waste Is Again Great Pending Court Test of New Law

TULSA, Oct. 12

UNTIL the federal court decides the constitutional questions before it, the conservation of gas in the Texas Panhandle will be largely theoretical.

Injunctions granted last week by three judge Federal court to Texas Panhandle Gas Co. and Texhoma Natural Gas Co., the latter a Cities Service affiliate, decisively set aside the order of the railroad commission without making any pronouncement as to the constitutionality of the statute.

The court held that the commission was attempting by its gas proration orders to compel pipeline companies to share their markets with producers lacking such facilities. The court took the position that the legislative act was meant to prohibit waste and the wasteful use of gas.

The law passed by the legislature last spring, with effective date of Aug. 1, is under attack by numerous companies. Injunctions and restraining orders exempting this company and that from the provisions of orders issued by the Texas Railroad Commission under authority of the gas law have reduced the whole program to virtual nullity.

It is easy now to get restraining orders from federal courts suspending operation of the commission's orders which set allowables and of the provision of the law which forbids waste under certain definitions, including the venting of gas into the air and the use of "sweet" gas for making carbon black. About all that is necessary now is to recite to the court that other companies are operating without restraint, by virtue of orders they have obtained. At the close of this week there were about a dozen court orders in effect and more reported in the offing.

The result is that gas is going into the air in large quantity and production of natural gasoline is increasing. When the law became effective Aug. 1 — as to "sweet" gas — there was an immediate drop in natural gasoline output. Estimates early in August were that a decrease of 25 to 30 per cent from the normal million gallons daily had resulted from application of the law.

First to obtain court relief was the Texas Panhandle Gas Co. early in August. This company supplies gas from its own wells to the Consolidated Gas Utilities Co., serving several Oklahoma and Kansas towns. Its chief contention was that the railroad commission had set an allowable so low that the company was unable to supply its market from its wells which had been and could be produced without waste.

The next companies to line up before the court asserted that to permit the Texas Panhandle to produce whatever it pleased meant drainage of their properties so long as they produced ratably. Some, with no market outlet except their gasoline plants, obtained court permission to resume stripping gas of its gasoline, popping the residue into the air.

Some of the suitors assert their belief in the constitutionality of the law but dislike the orders. In some suits the law itself is attacked.

Report of the railroad commission on gasoline plants for July shows daily average volume of gas blown into the air from the plants to have been 1,040,680,000 feet. The August report shows this to have been reduced to 299,623,000 feet daily. The September report, not yet completed, is expected to show a large increase over August in gas wasted in this manner. Field estimates now are that daily wastage from gasoline plants is again near a billion feet daily.

Half of Traffic in Oil Products Moves by Water

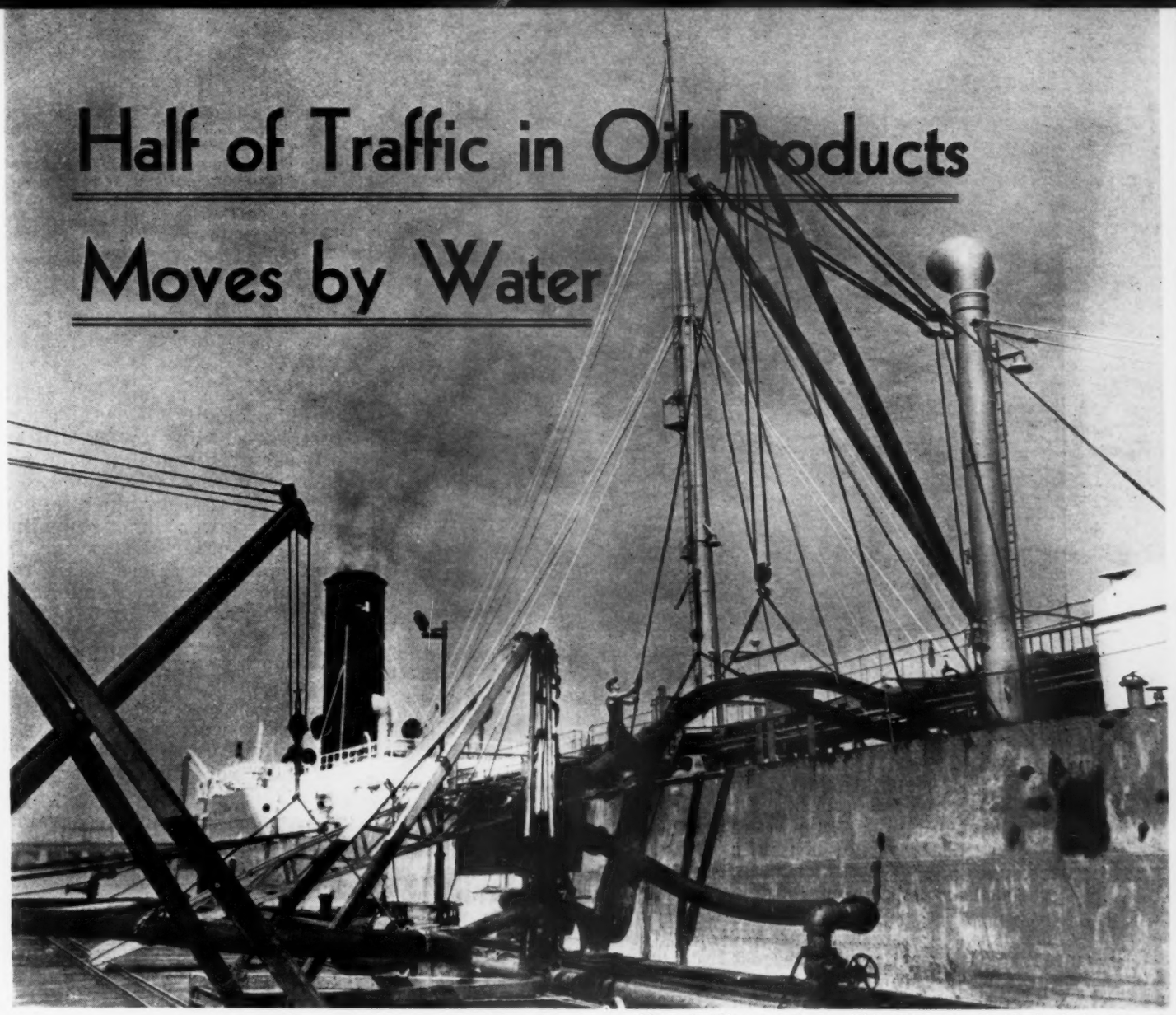


Photo by Margaret Bourke-White—Courtesy Hartol Products Corp.

By A. M. Petty
N. P. N. Staff Writer*

WATER transportation has served the oil industry since its birth. Barrels of crude oil from the first wells in Pennsylvania were barged down Oil Creek.

Since those early days, when seasons of drought and snag-filled rivers made such travel difficult, the U. S. Government has spent $2,000,000,000 developing a network of 27,500 miles of navigable inland waterways.

From a mere "trickle" of about 182,000,000 barrels in 1922, petroleum traffic on the waterways of the U. S. increased to 838,000,000 barrels in 1934.

Domestic movement of oil by water in 1934 was 266,000,000 barrels greater than in 1932. And in 1932, according to Federal Transportation Co-ordinator Eastman, 51 per cent of the total movement of petroleum products and 26 per cent of the crude movement was handled by water carriers.

Opportunities for low-cost water transportation are now open to oil marketing companies in many sections of the country under the present stage of development of the Mississippi River system, the Great Lakes, the Intracoastal Waterways, the New York Barge Canal, and numerous other waterways.

Even greater opportunities will be offered in the next few years as projects for new waterways and improvements are completed, for which hundreds of millions of dollars have been allocated.

The major oil companies have used water transportation for some years, barging their products up and down rivers and along inland waterways from their pipeline and ocean terminals. But many smaller marketing companies are awakening to the opportunity available for cutting down the competitive advantage of the major companies' pipelines and ocean tanker fleets.

Generally speaking, the water routes are available to commercial traffic on a rate basis 20 per cent lower than rail. Many industrial firms, including oil companies, have found it to their advantage to own and operate floating equipment.

The water rate structure, however, is not remarkable for its stability. Many water carriers in their effort to pace railroad and truck competition make much lower rates. It is this fluid competition which has

*The writer acknowledges the valuable suggestions and information supplied by Alfred H. Ritter, formerly chief statistician, office of Chief of Engineers, U. S. Army.

Loading one of the Oil Transfer Corp. tow barges in New York harbor. This barge measures 39 x 175 feet, and has four compartments with a total capacity of 480,000 gallons. It is equipped with two rotary pumps, and can discharge 2000 barrels per hour. The barge is equipped with two separate cargo pipe lines

• • •

forced the railroads off a dry-land basis in competitive territory. Extensive rail and water routes now are available on a joint-rate basis, linking the northeast and southwest and other sections of the country.

Eastman's report gives the operative cost per net ton mile (rail distance) of rail carriers as 8.3 mills; of water carlot carriers, 6 mills; of water cargo carriers, 1.25 mills; and of pipelines, 3.2 mills. These cost figures do not include interest, or expenditures made by others than the carriers (or operators) of the facilities. The transportation of full cargoes by water is shown to be the cheapest form of tranportation.

As replies received to the Eastman questionnaire were mainly common carriers and contract carriers, it is possible that more complete data on the cost of operating full cargoes in private business, such as in oil, ore, coal, sand, etc., would show even lower costs for full cargoes moved by water.

Figures furnished several years ago to Alfred H. Ritter, transportation specialist, covering a full year's operation and including interest at 6 per cent on the cost of property devoted to transportation, show:

Carrier	Cost per Ton-mile
Monongahela River, fleets of towboats and barges	$.00465
Great Lakes, fleet of bulk freighters	.00078
Intercoastal fleet of general cargo carriers on the ocean	.00147

On the Monongahela a project nearing completion provides a 9-foot depth permitting the use of larger barges, which would probably lower the above cost. According to Mr. Ritter, oil in suitably designed barges can be moved at a somewhat lower cost than by pipeline, and certainly lower than at pipeline rates. Another advantage is that quantities less than the pipeline minimum tender requirements can go by barge, he points out.

Recent years have witnessed a large increase in oil traffic on the waterways. Tonnage figures for 1934 were nearly 20 per cent above those for 1933, and about 40 per cent greater than in 1932.

Accompanying charts graphically show how the oil industry is turning to water transportation. They are based on commercial statistics collected by the Office of the Chief of Engineers, U. S. Army, which are adjusted to eliminate duplication. In all instances, figures for 1934 are preliminary and subject to revision when the annual report goes to Congress in January.

Not including imports or exports, about 210,000,000 barrels of gasoline were transported by water in 1934 in the U. S. Gasoline production totaled 423,801,000 barrels, including 24,686,-

Movement of Crude Oil and Its Products by Water for Domestic Consumption—1928-1933

From Reports of the U. S. Engineers Office, Washington

(*Figures in Barrels*)

	Crude Oil		Fuel, Gas Oil		Gasoline		Kerosine		Lubricants		Petroleum Products Unclassified	
	1928	1933	1928	1933	1928	1933	1928	1933	1928	1933	1928	1933
I Ports:—												
(a) Atlantic Coast	98,742,400	137,362,000	119,080,000	125,951,000	88,928,000	129,008,000	5,200,000	19,797,300	26,702,000	10,987,800	61,865,800	85,823,200
(b) Gulf Coast	112,234,000	163,423,000	44,357,400	73,529,300	51,175,700	74,912,700	2,971,000	9,020,600	3,747,300	3,192,900	22,403,600	14,469,300
(c) Pacific Coast	61,170,300	64,643,400	81,169,900	73,932,400	31,860,300	62,992,200	1,376,000	3,684,000	1,231,000	1,874,400	85,843,400	4,796,300
(d) Great Lakes	.....	19,343,400	746,300	4,455,500	14,508,000	21,861,500	1,180,400	826,900	66,100	235,000	662,900	737,400
II Rivers:—												
(a) Atlantic Coast	.....	.....	5,068,400	7,225,700	9,266,000	19,430,600	485,900	3,205,900	168,500	137,500	3,505,000	19,417,100
(b) Gulf Coast	3,436,200	33,337,200	1,320,700	2,033,100	70,800	1,928,800	16,800	142,800	30,000	54,500	100	63,500
(c) Pacific Coast	.....	3,900	3,484,800	1,631,000	908,800	2,125,200	11,200	48,100	25,200	46,500	68,800	2,600
(d) Mississippi River and tributaries	8,328,200	15,069,500	6,153,700	20,646,900	3,301,000	10,502,600	101,100	1,210,800	8,000	274,300	27,421,700	53,500
III Canals and Connecting Channels:—												
(a) Federal	51,170,200	73,302,800	6,115,800	14,190,000	14,698,000	27,430,000	3,090,300	4,694,000	636,400	893,000	3,728,900	74,400
(b) State and Private	.....	9,200	253,700	527,500	618,000	1,543,200	69,700	42,800	71,700	12,300	2,671,100	8,786,000
Unadjusted Totals*	335,081,300	506,494,400	267,750,700	324,122,400	215,334,600	351,734,800	14,502,400	42,673,200	32,686,200	17,708,200	208,171,300	134,223,300
**Adjusted Totals	149,671,000	232,867,000	131,615,000	166,103,000	102,127,000	171,635,000	6,181,600	22,752,000	16,747,800	9,868,000	104,211,000	92,744,000

*Includes receipts and shipments, coastwise as well as local, internal and intraport traffic.
**Duplications are eliminated in the adjusted totals.

000 barrels exported. This indicates that water carriers handled well over half of the domestic movement of gasoline.

While the pipelines move about three-fourths of the crude, it is interesting to note that the domestic water movement of crude was about 259,000,000 barrels in 1934 as compared with 233,000,000 barrels in 1933 and 185,000,000 barrels in 1932. Crude production in the U. S. in 1934 totaled 908,065,000 barrels.

Domestic movement by water of fuel and gas oil in 1934 totaled about 214,000,000 barrels while in 1933 it was 170,000,000 barrels. Production of gas and fuel oil in 1934 totaled 335,353,000 barrels.

Water movement of kerosine has shown a steady increase but lubricating oil traffic has declined in recent years.

The rise and fall, and recent revival, of traffic on inland waterways is an interesting chapter in the history of commerce and transportation in this country.

Prior to the ninteenth century, the rivers, creeks and bayous were used for commercial purposes by various types of boats propelled by hand. There were no towed barges. Steamboats came into use about 1819, but it was not until the latter half of the century that use of towed barges developed. In 1875, there were only four tug boats and 30 barges between St. Louis and New Orleans. Twelve years later there were 16 tug boats and 120 barges on this section of the river. Coal movement from the Monongahela to the lower Ohio River and New Orleans was handled in large tows of wooden barges.

Construction of railroads into the Mississippi Valley and westward across the continent brought severe competition for the traffic carried by water. The railroads won out. Traffic that once went through the Port of New Orleans was diverted via rail carriers to North Atlantic ports, from which ocean rates to Europe were lower than the Gulf ports.

The World War brought an acute transportation emergency. Huge quantities of supplies moving to the seaboard for shipment overseas were tangled on the railroad lines. The government turned to the waterways for relief.

The steamboat era was almost a memory. The use of towed barges for general freight had not met with great success. Congress provided for operation of a fleet of barges under the U. S. Railroad Administration. Most of these barges were unsuited for the service expected of them, but attention of the nation had been turned to a remedy and a renewed interest in the inherent economies of water transportation was awakened.

In 1920, the government's floating equipment was turned over to the War Department and in 1924, by Act of Congress, the service became the Inland Waterways Corp. Today the government-owned corporation operates barges on the Mississippi from New Orleans to Minneapolis and from New Orleans to Birmingham, Ala., via the Warrior River.

Early efforts of the Waterways corporation were not without discouragement. From the start it was bitterly fought by the railroads.

"By its pioneering and consistent ability to support itself, through its own finances," General Ashburn, president of the corporation, points out, "the corporation pointed a way for the rehabilitation of water transportation upon inland streams and canals, so much so that considerable private capital has now been invested in such forms."

Today water transportation on the Mississippi River system flourishes, as it has not since the days of Mark Twain. Indeed, in recent years the traffic has been double that of the period when river traffic was at its height.

Expenditures for new waterway projects and improvements are an index to the country's interest in water transportation. Figures compiled by the National Resources Committee show that annual appropriations for

Totals for Crude and Products Moved by Water for Domestic Consumption—1928-1933

From Reports of U. S. Engineers Office, Washington, D. C.

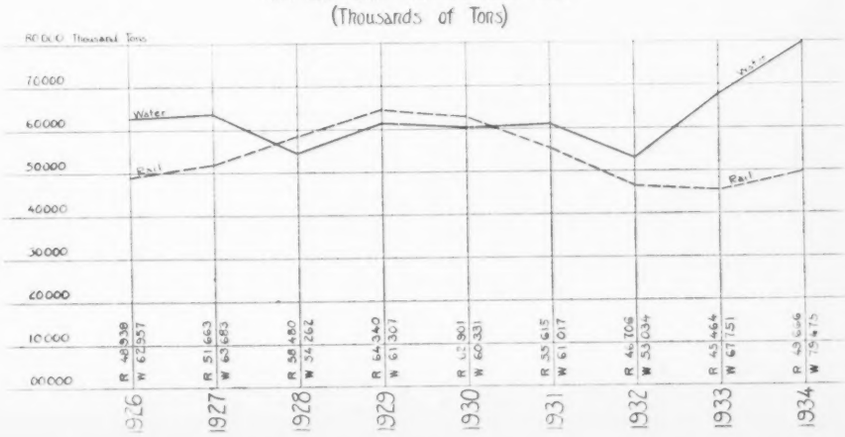
(*Figures in Barrels*)

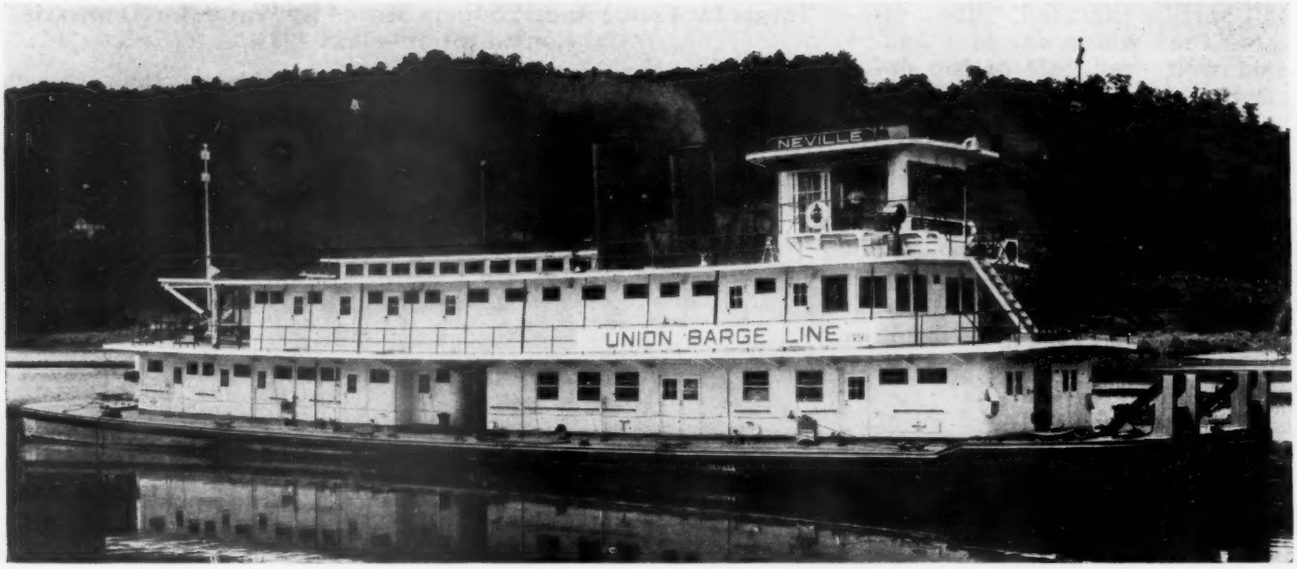
		1928	1933	Gains (and losses) of 1933 over 1928
Ports:—	Atlantic Coast	400,518,200	508,929,300	+108,411,100
	Gulf Coast	236,889,000	338,547,800	+101,658,800
	Pacific Coast	262,650,900	211,922,700	— 50,728,200
	Great Lakes	17,163,700	47,459,700	+ 30,296,000
Rivers:—	Atlantic Coast	18,493,800	49,416,800	+ 30,923,000
	Gulf Coast	4,874,600	37,559,900	+ 32,685,300
	Pacific Coast	4,498,800	3,857,300	— 641,500
	Miss. River & Tribs.	45,313,700	47,757,600	+ 2,443,900
Canals, etc. —	Federal	79,439,600	120,584,200	+ 41,144,600
	State and Private	3,684,200	10,921,000	+ 7,236,800
	Unadjusted Totals	1,073,526,500	1,376,956,300	+303,429,800
	*Adjusted Totals	510,553,400	695,969,000	+185,415,600

*Duplication of movement is eliminated in adjusted total.

PETROLEUM PRODUCTS

Comparative Tonnage Originated by Rail and Water Carriers 1926-1934 (Thousands of Tons)





Launched in the summer of 1935, this is the most modern of towboats used on river transportation to haul oil and other barges. The boat is all-steel, with ship-shaped hull 160 feet long, 34-foot beam and depth of 7.75 feet. Two six-cylinder Winton diesel engines develop a total of 750 horsepower. The towboat was constructed by the Dravo Contracting Co., Pittsburgh

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rivers and harbors averaged $15,000,000 from 1882 to 1906; $37,500,000 from 1906 to 1920; and $75,000,000 from 1920 to 1932. Since 1932 appropriations and allotments for rivers and harbors and flood control have totaled $611,575,000. To this will be added about $140,000,000 from the new $5,000,000,000 works-relief fund.

Just before adjournment, Congress enacted a Rivers and Harbors act authorizing 231 projects. Funds for 187 of these have been provided by PWA allotments. Others may be taken care of out of the works-relief fund, while those remaining will be financed out of the regular annual appropriations.

Mississippi River and Tributaries

The Mississippi River system, with present and projected improvements, offers great possibilities for water transportation of petroleum products, connecting as it does several of the refining centers with areas of dense population.

Domestic movement of petroleum and petroleum products on the Mississippi and its tributaries totaled approximately 71,000,000 barrels in 1934, as compared with 51,000,000 barrels in 1933. The principal gain was in gasoline and crude oil. Movement of gas and fuel oil slumped about 30 per cent.

The gasoline movement totaled about 27,500,000 barrels in 1934, as compared with 10,500,000 barrels in 1933. Movement of crude in 1934 aggregated about 19,500,000 barrels, as against 15,000,000 barrels in 1933.

In the Mississippi River there is now a nine-foot channel from the Gulf to the mouth of the Illinois River, above St. Louis, with a six-foot depth to Minneapolis. Extension of the nine-foot channel to the Twin Cities is expected to be completed by 1938.

A barge-transportation route nine feet deep connecting the Great Lakes at the south end of Lake Michigan (Chicago) with the Mississippi is now afforded by the Illinois River.

The Missouri River project calls for a depth of six feet up to Sioux City, Iowa. It is practically completed to Omaha, Neb. When the gigantic Fort Peck Dam is completed (expected in 1938) it will provide nine feet of water to Sioux City.

There is a nine-foot channel now in the Ohio River to Pittsburgh and beyond on the Monongahela and Allegheny rivers. When completed the Allegheny project will extend to East Brady, Pa., about 70 miles from its mouth.

The nine-foot project on the Monongahela, completed to about 124 miles south of Pittsburgh, will reach Fairmount, W. Va. The $10,000,000 Tygart Dam project, now being constructed with PWA funds, will provide this waterway with plenty of water during the dry periods.

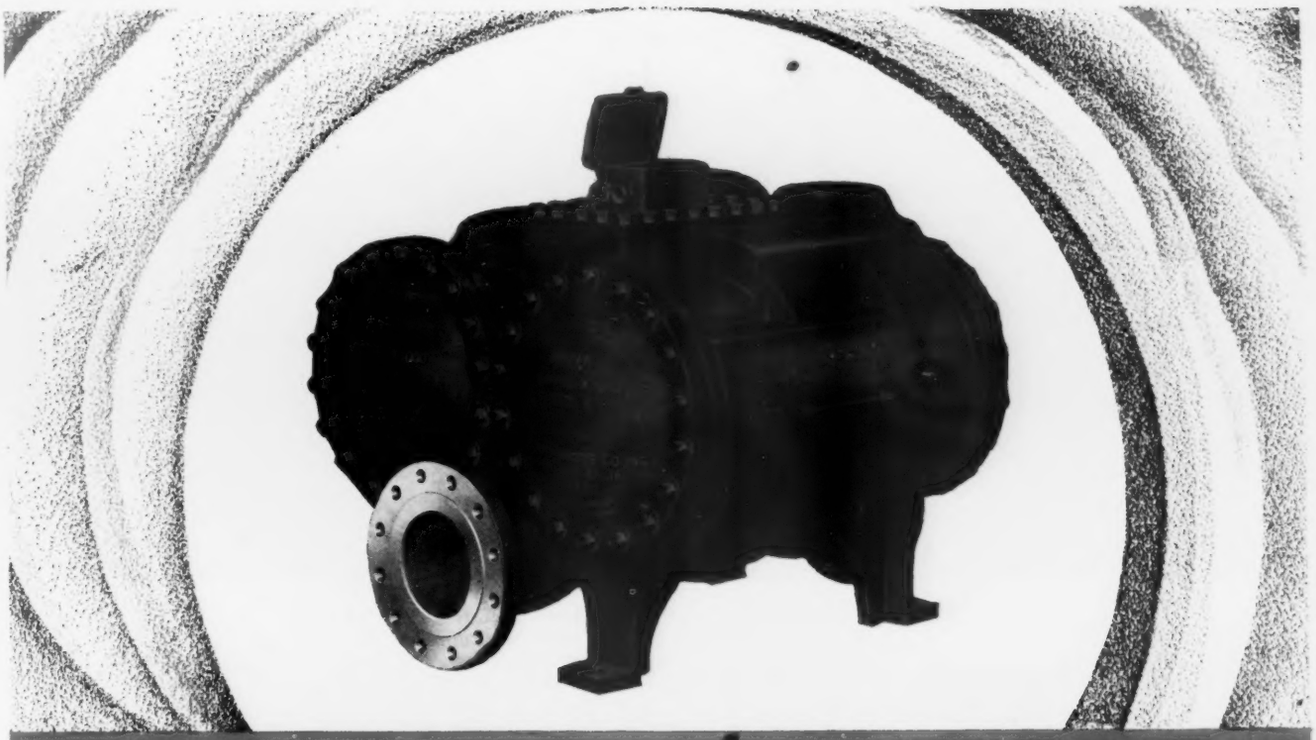
Oil traffic on the Ohio River in 1934 totaled about 9,100,000 barrels, of which 6,975,000 barrels was gasoline. In 1933, the total oil movement was 6,149,000 barrels, with gasoline accounting for 4,758,000 barrels.

Congress has approved a project for a channel 12 feet deep and 250 feet wide to the Youngstown area via the Beaver and Mahoning rivers. President Roosevelt is considering a recommendation that this project be allotted $5,000,000 for a start. Contingent upon final approval by Army engineers, Congress authorized the extension

Water Borne Movement of Petroleum and Products 1925-1934

(Imports and Exports not Included)

	Barrels
1934	803,212,000
1933	697,462,000
1932	549,324,000
1931	636,224,000
1930	600,168,000
1929	630,974,000
1928	519,706,000
1927	618,967,000
1926	620,002,000
1925	387,756,000



BIG METERS *for* BIG JOBS

The Brodie Series X Petroleum Meters include sizes for every application encountered. Where valuable petroleum products are handled in large quantities, such as; loading or unloading tankers, barges and tank-cars or at large bulk plants, Brodie BIG-CAPACITY Meters are most valuable. Each gallon (or barrel) is accurately measured and recorded as it flows through a pipe-line either under pump or gravity pressure. The flow is uninterrupted. No by-pass is used. Thousands of Brodie Series X Meters are in use under every type of service. Engineering data and flow diagrams will be sent upon request.

CAPACITIES

Model X-1000 (6-inch inlet and outlet), shown above, has a capacity of 1000 gallons per minute. Model X-500, at right, has a 600 gallon per minute capacity. Brodie Strainers and Air-Eliminators can be furnished for all meter sizes.

PRINCIPLES

All Brodie Meters are of the positive displacement type. Liquid is volumetrically measured in the calibrated cylinders. The Brodie twin-piston principle is the only petroleum meter design that permits identical construction throughout all sizes.

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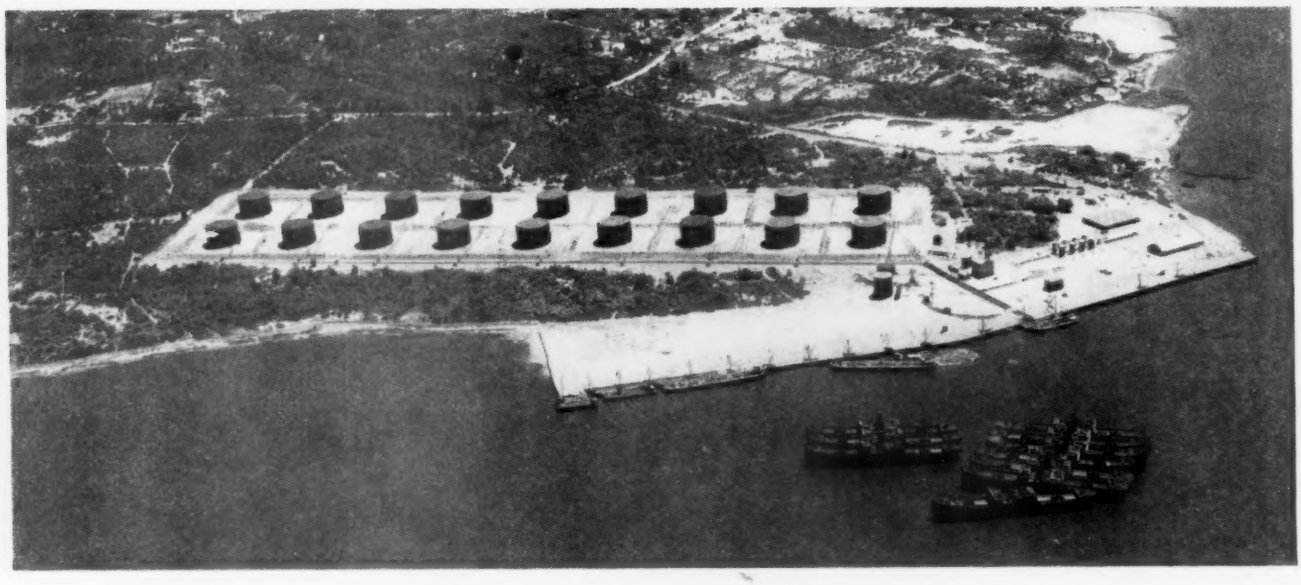

Airplane view of the new Port Socony at Staten Island, N. Y. This marine terminal has a storage capacity of over 60,000,000 gallons, and it is estimated that over a quarter of a billion gallons of petroleum products will pass through its 8 miles of pipe line during 12 months

of this project to Lake Erie, coming out near Ashtabula, Ohio. A survey of this long-sought connecting link between the Great Lakes and the Ohio River is now being made.

Practically all of the Ohio River's tributaries have a substantial movement of oil. With projected improvements, additional areas will be opened to barge traffic.

Improvement of the Kanawha River in West Virginia, providing a nine-foot channel to Charleston, is underway with a PWA allotment of $8,775,000. On the Cumberland River, PWA has allotted $685,000 to secure a six-foot channel to Nashville, Tenn.

Projects for other tributaries of the Ohio include the Little Kanawha River, four feet; Big Sandy River, six feet; and Kentucky River, six feet.

Shippers in interior southeastern states for years have bemoaned the fact that there was no adequate water transportation to compete with the railroads. But projects now under way and others proposed, if adopted, will eventually open up large areas to water carriers.

A nine-foot channel on the Tennessee River from its mouth at Paducah, Ky., to Chattanooga and beyond to Knoxville, also serving Florence and Huntsville, Ala., is part of the TVA project. This will open up a large area to Mississippi and Ohio River barge traffic which is now without adequate water transportation.

There is a proposal for a canal connecting the Tennessee River with the Tombigbee River. This would provide an almost straight-line water route south from the Ohio River at Paducah, Ky., to the Gulf at Mobile, Ala.

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New York Barge Canal

Petroleum and its products rank first in importance from a tonnage standpoint on the New York Barge Canal, which extends from Albany to Buffalo and Oswego. This waterway, connecting the Hudson River with Lake Erie and Lake Ontario, has enjoyed a steady increase in oil traffic. In 1934 oil traffic on this waterway totaled about 12,000,000 barrels, an increase of more than 2,000,000 barrels over 1933.

In 1920, only one oil company used the canal, operating one motorship and eight barges. During the 1934 season, 22 different brands of petroleum products were transported in about 100 barges and motor ships.

The 1935 Rivers and Harbors Act authorized the deepening of the barge canal connecting Lake Ontario with the Hudson. With the present 12-foot depth the project is handicapped, as Canadian channels on the St. Lawrence River have a 14-foot depth.

Congress has authorized a survey for improvement of a waterway from Montreal, Can., through Lake Champlain, to connect with the Hudson.

The Great Lakes and Connecting Waters

The Great Lakes and their connecting channels form a natural transportation highway having a surface over 95,000 square miles and a shoreline of more than 8300 miles. From Montreal, which is at the head of ocean navigation on the St. Lawrence River, the sailing distance to the head of Lake Superior is about 1340 miles, and to the south end of Lake Michigan, about 1260 miles. About 1000 miles of each of these distances are in the open lakes where no improvement has been necessary.

The greatest obstacles to navigation were the falls of the St. Marys River at the foot of Lake Superior and Niagara Falls between Lake Erie and Lake Ontario. A small canal was built around St. Marys Falls on the Canadian side in 1796-98 but was later destroyed. In 1855 the state of Michigan completed a canal with a double lift lock; this canal was taken over by the federal government in 1881 and enlarged.

The falls of Niagara have been surmounted by the Welland Canal, which has been re-

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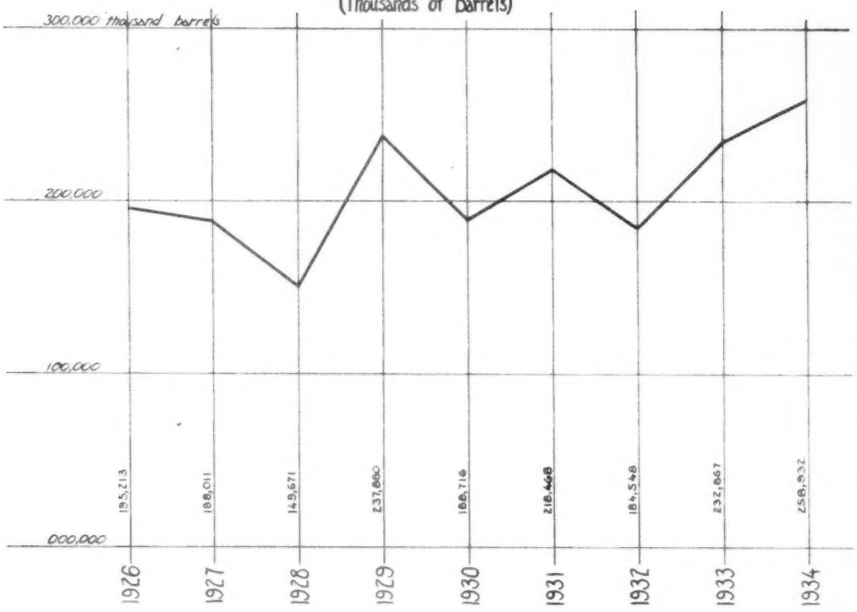
CRUDE OIL

Domestic Movement by Water 1926-1934
(Thousands of Barrels)



cently improved by Canada to provide a depth of 27 feet.

A $20,000,000 project for improving connecting lake channels to accommodate vessels with a draft of 24 feet is nearing completion. In the 1935 Rivers and Harbors Act, Congress authorized the provision of corresponding depths in 18 of the principal ports. Most, if not all, of these ports have received allotments from PWA for the purpose.

These improvements permit large lake freighters to proceed from Chicago or Duluth into Lake Ontario. Beyond that the large vessels must transfer their cargoes to smaller vessels able to navigate the 14-foot channels of the St. Lawrence to Montreal or the 12-foot New York Barge Canal.

The Great Lakes are connected with the Gulf by a nine-foot channel via the Illinois Waterway and Mississippi system, and with the Atlantic Ocean by the St. Lawrence and the New York Barge Canal and Hudson River.

Besides the proposals for a Lake Erie-Ohio River canal and Albany-Montreal waterway via Lake Champlain, there is also the St. Lawrence Seaway project, providing a 27-foot channel from Montreal to Lake Ontario. This depth would accommodate about 90 per cent of the general freight vessels of the world, including all but the largest tankers.

A treaty for this project between the U. S. and Canada has been signed but as yet has not been ratified by the U. S. Senate. President Roosevelt has long been an ardent advocate of the Seaway.

Opening up the Great Lakes to ocean-going tankers would have an incalculable effect on oil marketing for hundreds of miles inland from the lake shores.

Intracoastal Waterways

Few persons in the interior states realize that there is an inland waterway from Boston, Mass., to Corpus Christi, Texas. Not all the sections of this project have the same depth, but it is at least six feet deep. Protected waters of bays and inlets are utilized wherever possible.

Congress has approved a $32,000,000 project for deepening the Cape Cod Canal from 20 to 32 feet, and widening it to 500 feet. A PWA allotment of $5,838,137 has been made to start it. Another PWA allotment of $5,307,165 is being used to improve the lower Atlantic section of the intracoastal waterway. Numerous smaller projects for improving local harbors are also under way.

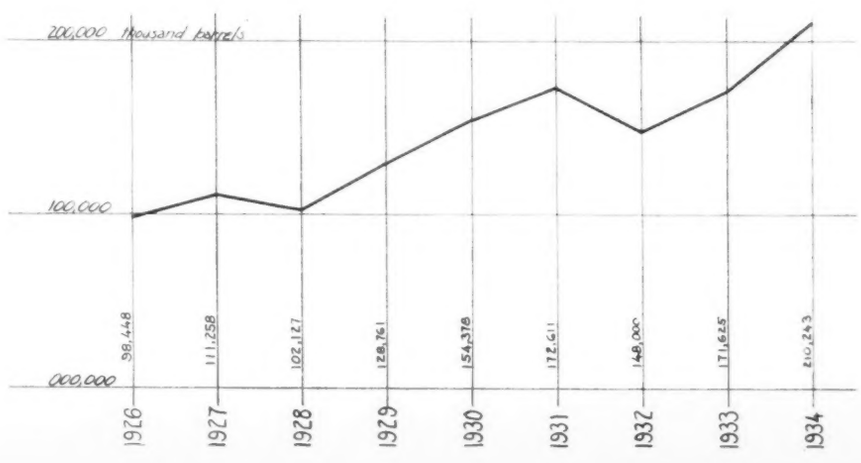
A survey for a deeper waterway connecting New York harbor and Delaware River (Philadelphia) has been authorized by Congress.

President Roosevelt on Sept. 3, 1935, allocated $5,000,000 from the works-relief fund for an immediate start on the centuries-old project of a Cross-Florida canal. This will be a sea-level waterway with a minimum depth of 30 feet. The project, more than twice as large as the Panama Canal job though not so difficult, will cost $146,000,000. This shortcut will save a day or two on routes from the Gulf.

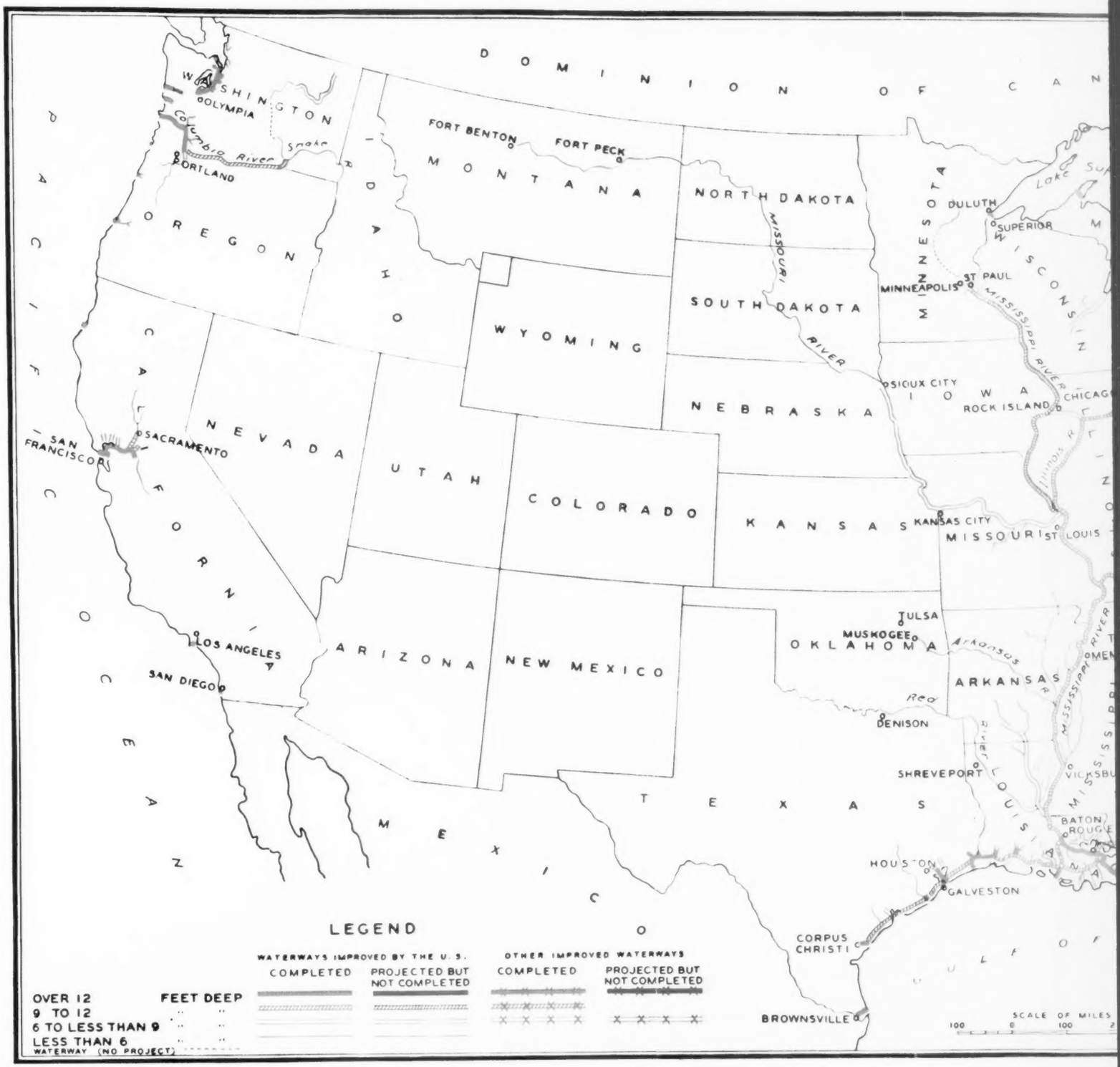
A traffic survey indicates that

GASOLINE

Domestic Movement by Water 1926-1934
(Thousands of Barrels)



Inland Waterways Systems of the United States, Compl



Prepared for National Petroleum News from data in the office of the Chief of Engineers, W

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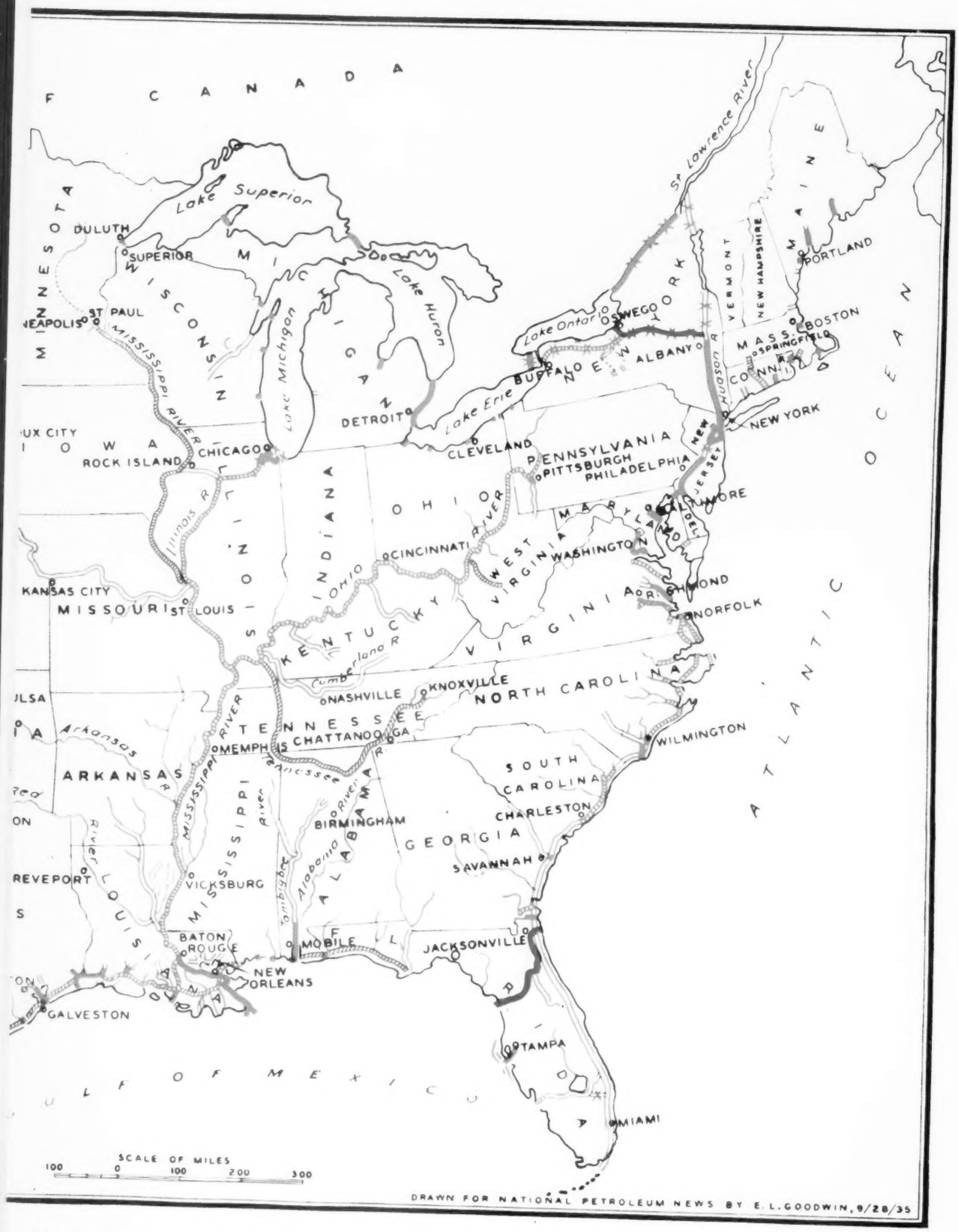
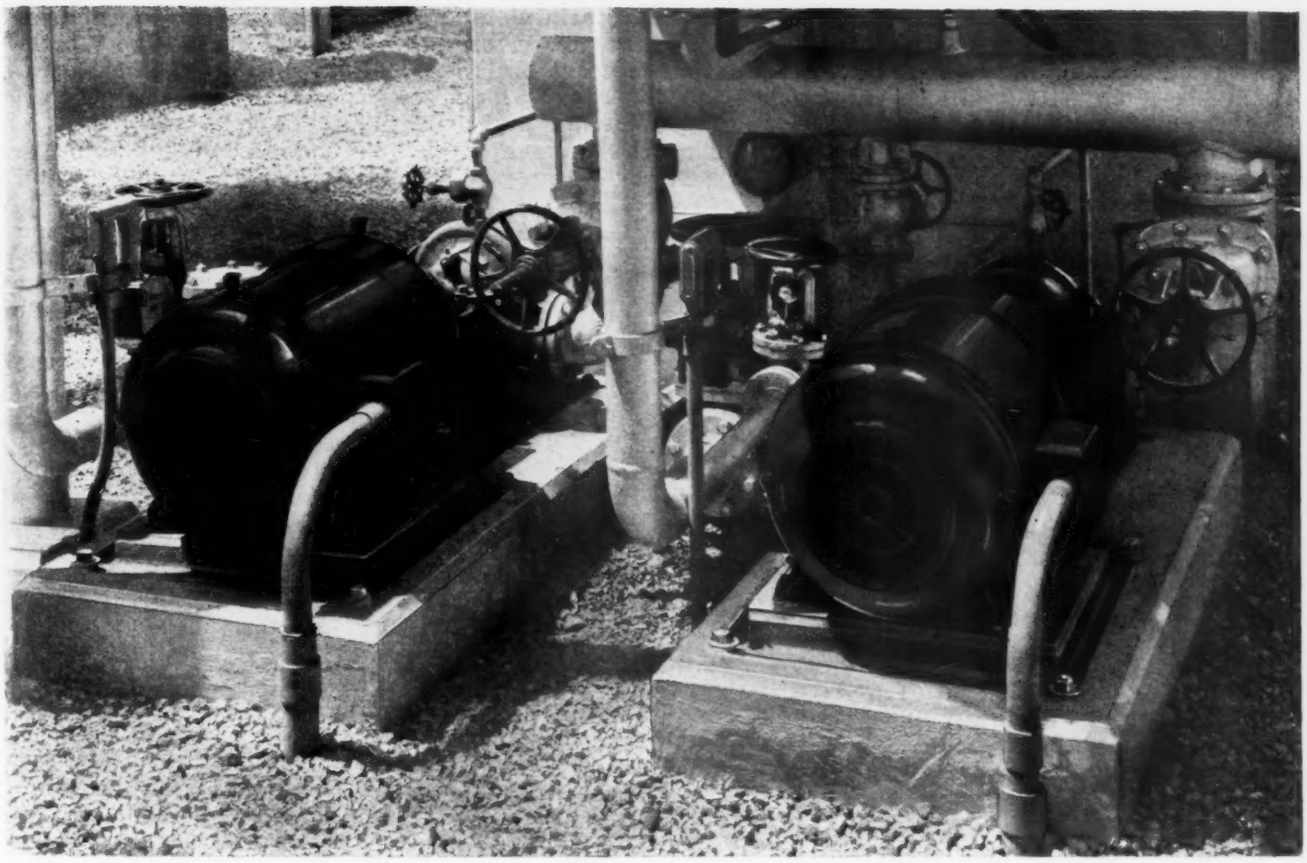
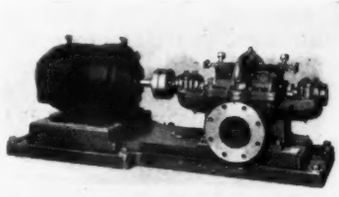


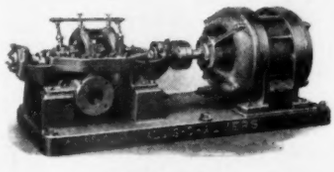
e Chief of Engineers, War Department, Washington, D. C.



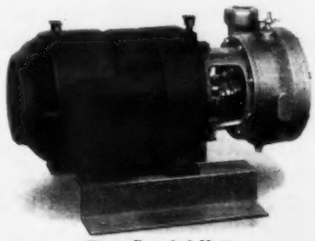
Complete Pumping Units
for Gasolines and Oils...



Single-Stage Unit



Multi-Stage Unit



Close-Coupled Unit

ALLIS-CHALMERS Motors and Centrifuqal Pumps form an unbeatable combination for pumping gasolines and oils. The pumps are built in a range of capacities and heads to meet most pumping problems. There is an Allis-Chalmers motor to drive every pump.

The two 50 hp., 3600 rpm. motors illustrated above, driving gasoline transfer pumps, are of the explosion-proof type. They are painted red to distinguish them from other types and as an indication that they are **safe** for dangerous places. They have been approved by the Underwriter's Laboratories for use in hazardous atmospheres such as gasoline vapor. They need no fire-walls and may be installed in the open without covering.

Additional facts on Allis-Chalmers unit responsibility for motors and pumps can be obtained from the district offices located in all principal cities.

ALLIS-CHALMERS

— Allis-Chalmers Manufacturing Company, Milwaukee, Wisconsin, U.S.A. —

oil would make up 75 per cent of the available tonnage. However, the important question of how much, if any, tolls will be charged has not been announced.

The recently-completed section of the Intracoastal Waterway from the Texas Gulf Coast to New Orleans makes it possible for gasoline and other petroleum products to be barged from Texas ports into the Mississippi River system, or along the coast to Mississippi, Alabama and Florida ports.

Rivers Flowing Into the Atlantic and Gulf

From the Penobscot River in Maine to the St. Johns River in Florida, there is scarcely a stream, bay or inlet along the Atlantic coast which does not have some oil traffic. From Bangor to Jacksonville, cities like Hartford, Washington, Richmond, and Augusta, Ga., some as far inland as 200 miles or more, receive much of their gasoline and petroleum products via rivers. In many instances oil constitutes more than half the total tonnage of these waterways.

From ocean terminals, the oil traffic moves upriver or along the intracoastal waterway to smaller water terminals where it is trucked further inland.

Among the PWA allotments for improvements to rivers along the Atlantic coast is one for $1,120,000 for a new lock and dam to provide an eight-foot channel on the Cape Fear River, N. C., from Wilmington to Fayetteville.

AN INITIAL $500,000 has been allotted from the works-relief fund for the $37,500,000 Santee-Cooper project in South Carolina which will provide a navigable waterway from Charleston to Columbia. Petroleum products are counted upon to furnish the bulk of the traffic.

Miami Harbor has been allotted $2,202,126 by PWA, and Tampa, $1,239,360, for improvements. Moorehead City, N. C., received $1,555,000 and the James River (Richmond), Va., $585,835.

In some instances, such as Shipyard River, S. C., where Gulf Refining Co. has a terminal, the improvement is authorized to aid vessels in reaching the oil company's plant. In other cases, the reports call attention to the large volume of oil traffic in urging the improvements.

Few of the Texas rivers flowing into the Gulf are navigable for any distance inland. However, for years there has been proposed a project to canalize Trinity River from Fort Worth-Dallas to the Gulf. Such a waterway would reach into the oil regions.

The volume of oil tonnage flowing through Houston, and other Texas ports has encouraged the government to spend millions of dollars on these harbors and waterways in recent years. An increasing tanker movement from Texas to New Orleans, thence by barge up the Mississippi River, is expected as deeper channels upriver are completed.

Should the proposal be adopted to connect the Tombigbee River with the Tennessee River, a more direct inland water route from the Gulf to the northeastern and central states would be available. The Tombigbee is navigable now from Mobile, Ala., to the vicinity of Birmingham.

Pacific Coast Rivers

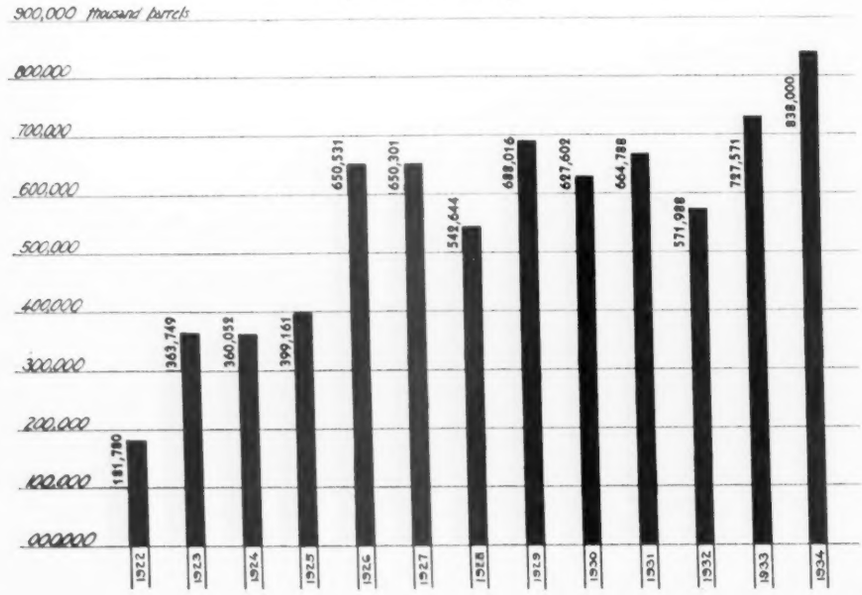
Several of the giant power development, flood control and irrigation projects on the Pacific Coast will also improve navigation and provide new waterways.

The Bonneville Dam, on the Columbia River which divides Oregon and Washington, will provide for a nine-foot channel on the Columbia all the way to the mouth of Snake River, a distance of 144 miles. After making its original allotment PWA added another $1,200,000 to equip the dam with locks permitting the passage of sea vessels. This project has received $32,440,000 from public works funds and is now well underway.

The Central Valley project in California, to cost $170,000,000, has been allotted $20,000,000 to start. It will improve navigation on the Sacramento and San Joaquin Rivers. Army engineers have authorized $12,000,000 for navigation and allied projects.

PETROLEUM & PETROLEUM PRODUCTS

Total Domestic Movement by Water 1922-1934
(Thousands of Barrels)

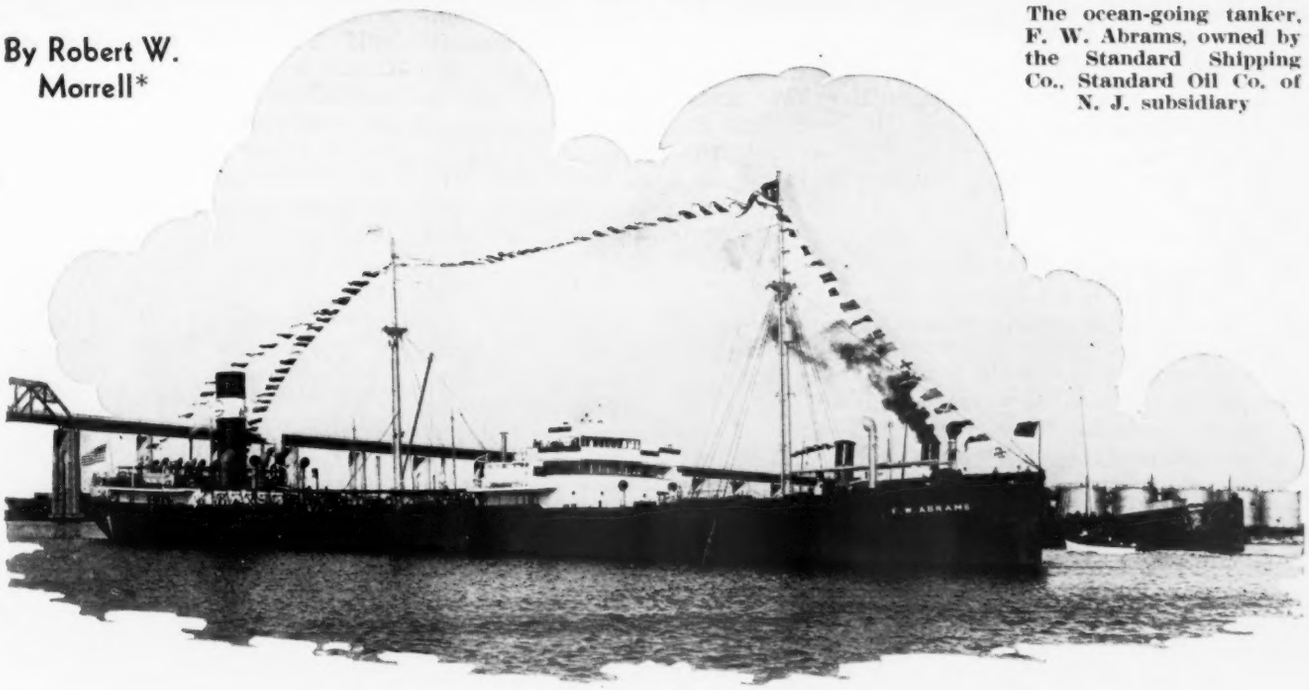


Builds Two New Tankers

NEW YORK—Gulf Refining Co. has contracted with the Sun Shipbuilding and Drydock Co. for the building of two 11,000-dead-weight-ton oil tankers at an approximate cost of $3,000,000. The tankers will be 425 feet between perpendiculars, have a beam of 59 feet and a depth of 34 feet, it was stated.

ADVERTISING PAGES REMOVED

By Robert W. Morrell*



The ocean-going tanker, F. W. Abrams, owned by the Standard Shipping Co., Standard Oil Co. of N. J. subsidiary

Fast, Clean Ships—These Tankers

Special Engineering Has Developed Methods for Handling Cargoes of Many Thousand Barrels Quickly and with Safety to Crew and Nearby Shipping and Property

IN THE shipment of petroleum from the producer to the market, three methods are available, by rail, by pipeline, and by water.

The last form of transportation, namely, by means of floating equipment, has become a large factor in the oil business, and represents an important link between the petroleum industry and the marine industry, particularly with respect to the delivery or distribution of refined or topped products from the refinery to the consumer.

This activity is carried on mainly by tank vessels of the types known as the coastwise type and the lake, river, bay and sound type, the latter representing inland water transportation.

Tankers of these types may be owned and operated by oil companies directly for the delivery of their own products, or they may be owned by independent transportation companies who are engaged solely as carriers.

As a general proposition, an oil company will not own sufficient marine equipment to handle its maximum requirements. These requirements may be highly fluctuating, and if sufficient tonnage were owned by an oil company to care for its peak requirements, part of such tonnage would be idle in the slack periods and would have to seek employment elsewhere.

Therefore, an oil company having its own floating equipment will draw on outside sources for its peak demands, by chartering from other oil companies or from the independent carriers.

In like manner, the transportation companies serve the requirements of three sources: first, those of oil companies having no marine equipment; second, the peak demands of oil companies having marine facilities only for their normal business; and third, perhaps, the peak demands of other transportation companies.

This interchange of tanker equipment by chartering represents an extreme flexibility of equipment and reflects the highly fluctuating conditions of the trade. It has built up a form of exchange which is known as the tanker charter market, which in itself is fluctuating as to rates.

There are two forms of charter-party; the time charter and the voyage charter. The time charter is for a given period of months, during which the charterer hires the tanker at so much per month, the owner usually paying for such continuous or constant items as overhead, crew wages and subsistence, and maintenance, while the charterer pays for fuel, fresh water and port charges, which are a function of the service in which the vessel engages for the charterer.

The voyage charter is one in which the charterer pays the

*Consulting naval architect and marine engineer, New York.

owner so much per barrel or per gallon for the transportation of oil from one point to another, and the owner pays all operating expenses. This is the more common form, and would apply even to small harbor deliveries.

The charter rate for this form is affected by the length of the voyage or delivery distance, the port and voyage conditions, and the size of the vessel or shipment. It is also influenced by such factors as the general demand for tonnage in the movement of oil, the price of new tonnage, and so on. Basically, it is a matter of supply and demand. The extent of shore storage facilities at the terminals also has some bearing. Naturally, the rate is higher for clean tankers, suitable for carrying refined products subject to discoloration, than for dirty tankers which can handle only crudes and fuel oils.

Such charters may be in the form of a charter-party for a given voyage or voyages, or in the form of a contract for deliveries at a given rate over a stated period. This form of charter is on a freight or bill of lading basis.

Freight is usually paid on the basis of the out-turn quantity of cargo. It is customary to have the intake and out-turn quantities measured by oil inspectors, who also examine the vessels tanks before loading cargo, with respect to cleanliness, water, sediment, etc.

This gauging of the cargo is generally done by means of shore tank measurements, but is often checked by gauging the ship's tanks. This is particularly necessary in the case of small deliveries, such as in harbors, and especially in deliveries of bunker fuel to ships and in cases of deliveries of part cargo to different points.

The practice of gauging the cargo in the ship's tanks, or "taking ullages," necessitates a very accurate calibration of the tanks, which are of course irregular in shape due to the form of the hull. This calibration is done either by elaborate calculations from detailed measurements of the dimensions of the tanks, or by a "strapping" process which consists of putting known quantities of water or oil into the tanks and noting the corresponding heights. Gauging of cargo in the tanks of a ship involves not only the usual corrections for temperature but careful correction for the trim of the vessel.

SAMPLES of cargo are quite often taken from the bottom of the ship's tanks, except in cases of small or harbor deliveries, to test for the presence of water and sediment before discharging. Tests are also sometimes made by means of litmus paper, or by chalk on a sounding rod, to test for water.

Tanker charters often provide for demurrage and lay time for loading or discharging or both. The owners tender the vessel to the shipper or charterer, who must provide a proper berth within reasonable time. In loading, he must also provide facilities to load the tanker within a reasonable time. In the case of discharging, the pumping is up to the ship and it is simply necessary to provide facilities to receive the cargo at a reasonable rate of discharge at proper pressure. Any delay to the ship beyond these reasonable limits is charged by the ship as demurrage, at an agreed amount per day. The agreement also includes any necessary stipulations regarding the shutting down of loading or discharging at night, the use of shore steam, shore vapor lines, and so on.

Tanker charter-parties are usually fixed by tank ship brokers, although they are frequently arranged with or between the oil companies or tanker owners direct.

The types of tankers engaged in the delivery of petroleum products to the market in the U. S. are the coastwise and the harbor types. The coastwise type is in effect a small edition of the big seagoing tankers, with restrictions, determined by the service, with respect as to draft, and in many cases as to dimensions with a view to canal transit. Tankers of this type are in the main steel, self-propelled vessels of moulded or ship-shaped form, in which the bulk cargo is carried in tanks which are part of the hull itself. The hull is divided into tanks by means of steel oil-tight bulkheads, with the customary arrangement of cofferdams, pump room, etc.

The harbor type has a more distinct subdivision into self-propelled and non-propelled craft. Many of the self-propelled type are similar to the coastwise tankers, but smaller, and may be of special design for shoal draft work.

The non-propelled class of tankers are frequently referred to as "dumb barges" and their hull forms in general fall into two classes: the scow form, which is simply a rectangular box with raked ends, and the car-float form, which has rounded bilges and some slight curvature or shape at the ends but is not fully ship-shaped. For harbor work, in restricted waters, these barges are usually towed with the tug alongside. For river work, they are frequently made up into blocks or groups of several barges together and are pushed by the river towboat.

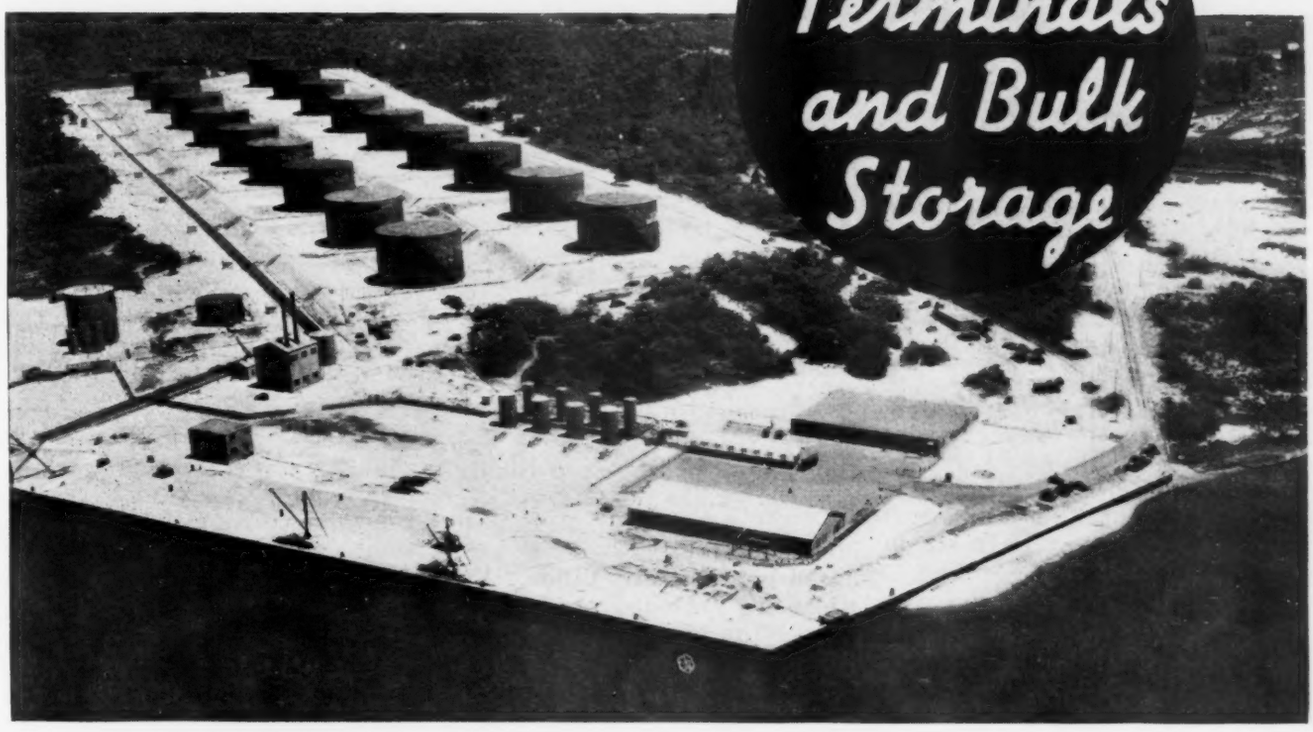
On the other hand, some non-propelled tank barges are used for coastwise or port-to-port service, as distinct from harbor service. These would be rather larger barges, of ship-shaped hull form for lower resistance on long hauls when towed on a nawser, and they would have their own rudders and steering-gear. Most of this class of tankers were freight barges which have been converted into tankers.

Some of the small tankers, both self-propelled and non-propelled, are of a type in which the bulk cargo is carried in separate tanks which are not an integral part of the hull structure but which have been installed in the hull as independent units. These tanks are of steel and may be cylindrical or square or specially shaped to suit the hull. This is quite a common procedure in converting freight barges or small power-driven vessels into tankers. There are many boats of this type, both wooden and steel hulled, operating in New York harbor. Most of them have their own propelling machinery.

Speaking of propelling machinery, there is quite a diversity of opinion reflected in the

PORT SOCONY Largest Seaboard Marine Bulk Terminal. One of five Terminals constructed during the past five years for Socony-Vacuum Oil Co., Inc.

Marine Terminals and Bulk Storage



WHAT ARE YOUR TERMINALS COSTING PER BARREL OF STORAGE?

★

ENGINEERING
CONSTRUCTION
PIPING
LAYOUTS
ESTIMATES
SURVEYS

★

A project of this kind requires careful consideration of geographical location, analysis of marine and storage facilities, layout of equipment and determination of capital investment and operating cost.

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propulsion equipment of the self-propelled tankers now in operation. In the coastwise type and in most of the self-propelled harbor tankers, the tendency seems to be toward diesel propulsion. In some few cases it is diesel-electric. Many of the smaller harbor craft have gasoline engines as the motive power. However, for tankers handling heavy oils, such as Bunker C fuel, requiring the use of heater coils, the consideration of steam propulsion remains an important factor.

A characteristic of all tankers, both ships and barges, is their self-contained pumping and piping system for discharging their own cargoes.

With steam propulsion, steam-driven cargo pumps of the horizontal duplex type are common. Even with diesel propulsion, if the tanker has a donkey boiler she may have steam pumps as well.

If steam is not available, as in the usual diesel tanker, the cargo pumps will be of the rotary type, driven by electric motor or by an auxiliary engine of the internal combustion type.

If the pumps are motor-driven, this presents a problem. Spark-proof and explosion-proof motors are available, but are always subject to the hazard of human negligence. They are used to some extent in practice, but more often the motors are placed in a well-ventilated gas-tight compartment adjacent to the pump room, with a shaft extending through the bulkhead and fitted with a stuffing box.

The same hazard of sparking exists with pumps driven by oil engines. Diesel engines are the safest in this respect, and in some tankers are located right in the pump room, with good ventilation. But a gasoline engine or the so-called "semi-diesel" should never be in the pump room.

In many of the harbor type of tanker, the cargo pumps and engines, usually gasoline, are located on deck, with some sort of protection. For heavy oils, it is usually desired to have the cargo pumps below deck, to minimize the suction lift.

The size of cargo pumps is often governed by the terminal conditions, such as size of shore pipelines, steam supply, etc. In general, the pumping capacity is sufficient to discharge the tanker's cargo in 10 or 12 hours. The pumping rate cannot be maintained when draining the tanks. In some of the larger and better-equipped vessels, separate stripping pumps and piping are provided for that purpose.

ALMOST standard practice for oil piping is a suction main near the bottom of the tanks, with a suction branch, fitted with a bell-mouth, in each tank. A suction valve is located in each branch, preferably close to the bell-mouth, and is controlled from the deck by means of an extension rod. The suction piping is also used for filling, by means of a by-pass around the pump. Filling by means of an oil hose in the tank hatch is practically taboo. Fittings are provided on deck for connecting oil hoses to the piping system.

Tankers operating in exposed waters have to provide for handling water ballast in the cargo tanks, for running in the light condition. This is done by means of a sea valve piped to the cargo pump. A double set of valves is always provided.

Much might be written about the details of the tank and hatch fittings, tank venting systems, flame arresters, and general equipment peculiar to these tankers. Space will not permit, except to say that the tanker presents a special set of problems of design, equipment and operation, from the standpoints both of economies and safety.

The feature of welded steel hull construction has been developed to a high degree in the recent period for vessels up to moderate size. The first cost is materially less than that of oil-tight riveted construction, and welding has been in use long enough to prove by experience the possibility of obtaining entirely reliable results, both as to strength and tightness.

The factor of corrosion of steel structure in tankers is a prominent one, particularly in the gasoline trade. The tanks of oil carrying vessels are subjected to the combined effects of the liquid cargo, petroleum vapors, salt water, moisture, and air. This problem has been the subject of much investigation and research recently, in the directions of protective coatings and of corrosion-resisting materials. Considerable consideration has been given to the economic possibilities of pure wrought iron for tanker structure and piping.

The safety features of tankers have received a great deal of additional attention of late. The seagoing tank ships owned by the large oil companies have been very well covered in this respect, but more consideration has centered lately on the smaller types.

The last Congress authorized the Secretary of Commerce to promulgate rules and regulations concerning the construction, equipment, and so on of all vessels carrying inflammable or explosive cargo.

Simultaneously, the Fire Department of the City of New York has developed, and is now holding hearings on, rules governing tank ships and barges operating within the Port of New York. The Port of New York Authority has been very active in this direction.

A committee of experts, under the auspices of the National Fire Protection Association, and with the co-operation of the American Petroleum Institute, also has been developing recommendations on this subject.

Fire prevention is the keynote of these considerations for tanker safety, with a view to minimizing the presence or effect of explosive mixtures, petroleum vapors, and air in handling oil cargoes on shipboard, together with the elimination of the possibility of the generation of any spark or other source of ignition in the vicinity of such dangerous mixtures. The inert gas system is a prominent development in this direction.

Fire-fighting equipment is also a factor, including fixed smothering systems (steam, foam, or carbon dioxide), and hand extinguishing apparatus. Safe and proper electrical equipment and ventilation have a prominent place.

Sensational!

ABOVE: One of the 10 THORNTON-equipped Ford trucks operated by Overland Transportation Co., Detroit. Truck shown carries 4,600-gallon tank on semi-trailer —44,250 pounds gross weight.

NEW LOW HAULING COSTS
. . . with Light Trucks!

THORNTON-equipped Ford truck owned by J. A. Mercier Oil Co., Detroit, carrying 1,500 gal. tank—18,000 lbs. gross.

THORNTON-equipped Ford truck owned by Giles Oil Co., Cynthiana, Ky., carrying 1,500 gal. tank—18,000 lbs. gross.

Big truck earning capacity with light truck economy! Strength for heaviest loads: 20,000 to 26,000 gross pounds on the chassis! 40,000 gross pounds and more with semi-trailer! Power for toughest going! Speed for every requirement! Eight speeds forward, two reverse.

These are some of the big, new advantages of the THORNTON Dual Ratio Four Rear Wheel Drive — designed for Ford and Chevrolet trucks. "Sensational," say owners of THORNTON-equipped trucks after thorough testing. Actual figures show operating costs cut 50% to 60%, earning capacity boosted to new highs. And the initial cost is 35% to 50% under the cost of equipment ordinarily required. Lower maintenance expense and longer life are equally surprising.

The THORNTON DRIVE is ruggedly built, quickly and easily installed, and guaranteed. It has proved its amazing advantages on hundreds of trucks in all kinds of service. Find out what it can do for you. Write today for complete information.

THORNTON TANDEM CO., ***Detroit, Mich.***

THORNTON *Dual Ratio Four Rear Wheel* DRIVE

Fig. 3—One of the largest tows of gasoline ever handled on the Ohio River. The barges are typical oil barges and the towboat a typical steam powered boat with rear paddlewheel. Towboats push rather than pull their "tows"

Ohio River Oil Shipments Double in Past Two Years

By M. G. Van Voorhis
N. P. N. Staff Writer

BARGE transportation of gasoline and other petroleum products on the Ohio River and its tributaries has doubled in the past two years and tripled in the past four years.

River transportation is being rediscovered as a cheaper means of shipping commodities perhaps as a result of the national celebration held in 1929 to dedicate the system of locks and dams which gave the Ohio River throughout its entire length and during the whole year a uniform stage of 9 feet. Perhaps because the past few years have spurred owners of businesses to look for economies in every direction.

While any discussion of costs of this transportation is full of pitfalls, due to the highly competitive bidding for this business and the varying conditions under which barging is carried on, it is no secret that savings of from 0.25 to 2 cents per gallon have been made over costs by other means of transportation.

Old timers will tell you that, as far back as 30 years ago petroleum products were barged on the river. The first gasoline to be brought into Pittsburgh by barge was in 1917, it is claimed. The Atlantic Refining Co. brought in casinghead gasoline from Sisterville, W. Va., in a wooden barge carrying six 10,000-gallon tanks. The second barge built for Atlantic was similar but carried nine 10,000-gallon tanks.

At present this company owns one steel barge of modern design, with a capacity of 3000 barrels. It carries gasoline from the refinery at Pittsburgh to four main distributing points on the Monongahela Rivers.

In 1924 the Standard Oil Co. of New Jersey purchased six steel barges of 2000 barrels capacity to transport petroleum products from its refinery at Parkersburg, W. Va. and from the Midland terminus of the Tuscarora pipeline. It is reported the company is planning to put additional barges in service to meet increasing demand.

One of the principal bulk terminals for distributing this water-borne gasoline is that of the Standard Oil Co. of Pennsylvania at Pittsburgh, where there are facilities for unloading six barges at one time and storage capacity for 3,500,000 gallons. The time required for a round trip from Midland to Pittsburgh is about 24 hours.

The Gulf Refining Co. took to the river in 1930 following the purchase of 10 new barges, eight of which are said to have a capacity of 7000 barrels. Going into barge transportation on a comparatively large scale for the short time that river transportation has been used, at least a dozen of the Gulf's own plants are being supplied by barge from the refineries on Neville Island at Pittsburgh and at North Bend, near Cincinnati.

According to the U. S. War Department statistics for 1934, barge shipments originating on the Ohio River in the Cincinnati district totaled 1,144,000 barrels. Gulf and Ashland Refining Co. are the only shippers, although other companies receive material by water. Figures on shipments for the Pittsburgh area must be divided among several large companies.

One year after Gulf's venture the Sun Oil Co. began with four barges, one of 7000 barrels capacity and three of 4200 barrels capacity. Shipments were made from the Vanport, Pa., river terminus of the company's gasoline pipeline from Marcus Hook. Sun's bulk plants are located at Cincinnati, Wheeling, West Brownsville, and McKeesport. The completion of a new 800,000-gallon capacity terminal in Cincinnati, removes Sun's storage from leased tankage to its own plant.

The major companies are making the most use of the river and probably the most advantageous use considering their ability to supply large volume shipments. However, distributors and marketers are seeing opportunities here and there and taking advantage of them. Cincinnati marketers

STEPS OUT INTO NEW TERRITORY

If you have ever motored through the Pennsylvania oil-fields, you will remember seeing the Sterling sign everywhere throughout this area.

If you talked to service station and garage men, you will remember they told you it was their big seller in this discriminating market.

For Sterling Motor Oil has long been the favorite in this section where all the best oil comes from . . . where oil competition is most intense. Sterling was first made in 1898, and is holder of Pennsylvania Grade Crude Oil Association Permit No. 1. While Sterling may be a new oil to you, it has a great reputation.

Up to now, distribution of Sterling has been pretty closely confined to that territory. Now production is stepped up. Sterling is out to sell new markets as it has sold the Pennsylvania oil-fields. You'll soon be seeing the Sterling service sign everywhere.

Sterling Oil is ready to go places. Here is your chance to go with it. Distributorships are still open in many territories. Distributors will be backed by local advertising and a well-rounded sales-promotion plan. Write or wire at once for further information.

"The Best Oil in Any Case"

100% PURE PENNSYLVANIA OIL

STERLING OIL COMPANY
Motor Oil Division
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were ahead of Pittsburgh. Several independent companies have started to use the waterway there since 1929, when the Tresler Oil Co. built its plant in spite of frequent admonitions that "it can't be done." The company prospered, however. At the present time it is handling Phillips products barged from East St. Louis and has leased a large portion of its storage to the Louisville Refining Co.

These were followed by other groups. The Tower Oil Co., Keenan Oil and Fuel Co., Cumberland Terminal Sales, Inc., and Ohio River Refining & Terminal Co. are all independent operators in the Cincinnati district which have dock facilities. The last named is a co-operative venture of three companies—Eureka Oil Co., The Hall-Rattermann Oil Co., and Merchants Oil Co., which has just begun operation.

In Pittsburgh, Republic Oil Co. gave up the distributorship of Shell products to market its own brand gasoline barged all the way from Good Hope, La. American Oil Co. is getting a similar organization under way, it is understood. Wiloil Corp. is making much use of water transportation, both on the rivers and on the Great Lakes, making shipments from the Gulf Coast up the Mississippi and from New York harbor through the New York State Barge Canal.

The typical river bulk plant is practically a typical inland bulk storage plant, except that its storage capacity is often larger, in order to handle the larger capacity carried by barges. In many cases, however, less than a barge load may be unloaded without great loss of time, since the dock is close to the ship channel in contrast to lake or ocean traffic where boats are normally far from shore. Thus several plants on a given waterway may be served by one barge making frequent trips and stopping at each on each trip.

Plants have been found which range in capacity from 35,000 to 7,500,000 gallons, the smaller of which are capable of handling only a fraction of the load of one barge to the complete tow, which is probably not over six barges. Few of these plants are dependent upon water transportation alone, in spite of the fact that the Ohio and some of its tributaries are open to navigation practically the whole year. Railway facilities are usually used for distribution from these bulk plants but at the same time also serve

Water Bulk Plants and Petroleum Terminals on the Ohio River and Its Tributaries

OHIO RIVER—Pittsburgh District

Location	Owner or Operator
*Neville Island	Gulf Refining Co.
Coraopolis	Republic Oil Co.
*Vanport	Sun Oil Co.
*Midland	Standard Oil Co. (Pa.)
Steubenville	Standard of Ohio.
Wheeling	Gulf Refining Co.
Wheeling	Sun Oil Co.
Wheeling	Standard of New Jersey.
Bellaire	DuBois Oil Co.
Moundsville	Standard of N. J.

ALLEGHENY RIVER—Pittsburgh District

Pittsburgh	Standard of Pa.
Pittsburgh, Herrs Island	Wiloil Co., Inc.
*Pittsburgh	Atlantic Refining.
Kittanning	Gulf Refining Co.

MONONGAHELA RIVER—Pittsburgh District

McKeesport	Gulf Refining Co.
Glassport	Standard of Pa.
Monongahela City	Atlantic Refining Co.
Donora	Gulf Refining Co.
Belle Vernon	Atlantic Refining Co.
Belle Vernon	Standard of Pa.
Brownsville	Atlantic Refining Co.
W. Brownsville	Sun Oil Co.
W. Brownsville	Gulf Refining Co.
Morgantown	Standard of N. J.
Morgantown	Gulf Oil Co.
Fairmont	Standard of N. J.
Fairmont	Gulf Oil Co.

YOUGHIOGHENY RIVER—Pittsburgh District

McKeesport	Atlantic Refining Co.
McKeesport	Sun Oil Co.

OHIO RIVER—Huntington District

Clarington, O.	Standard Oil Co.
New Martinsville	Gulf Oil Co.
Fly, Ohio	American Oil Co.
Fly, Ohio	American Oil Co.
Fly, Ohio	Pure Oil Co.
New Matamoras, O.	Standard Oil Co.
St. Marys, W. Va.	Sterling Oil Co.
Williamstown, W. Va.	Bridge Service Co.
Marietta	National Refining Co.
Marietta	Standard Oil Co.
Marietta	National Refining Co.
Marietta	Pure Oil Co.
Marietta	Sun Oil Co.
Belpre, O.	Standard Oil Co.
Parkersburg	Gulf Oil Co.
Long Bottom, O.	Standard Oil Co
Portland, O.	Southern Oil Co.
Antiquity, O.	Standard Oil Co.

KANAWHA RIVER—Huntington District

S. Charleston, W. Va.	Carbide & Carbon Chemicals Corp.
Charleston, W. Va.	Gulf Refining Co.
Charleston, W. Va.	Standard of N. J.
Charleston, W. Va.	American Oil Co.
South Malden, W. Va.	Owens Bottle Co.
Dickinson, W. Va.	Pure Oil Co.
Pratt, W. Va.	Standard of N. J.

ELK RIVER

Charleston, W. Va.	Pure Oil Co.

BIG SANDY RIVER

Kenova, W. Va.	Tri-State Refining Co.
Kenova, W. Va.	Sun Oil Co.
Leach, Ky.	Ashland Refining Co.

LITTLE KANAWHA RIVER

Parkersburg, W. Va.	Standard of N. J.

OHIO RIVER—Cincinnati District

Catlettsburg, Ky.	Ashland Rfg. Co.
Ashland, Ky.	Standard of Ky.
Ashland, Ky.	Ashland Rfg. Co.
Ironton, O.	Ashland Rfg. Co.
Manchester, O.	Standard of Ohio.
Manchester, O.	Pure Oil Co.
Maysville, Ky.	Ashland Rfg. Co.
Ripley, O.	Pure Oil Co.
Ripley, O.	Ripley Oil Co.
Cincinnati	Keenan Oil & Fuel Co.
Cincinnati	Cumberland Term'l Sales, Inc.
Newport, Ky.	Gulf Oil Co.
Cincinnati	Sun Oil Co.
Cincinnati	Pure Oil Co., Shell.
Cincinnati	Tower Oil Co.; Republic Oil.
Cincinnati	Tresler Oil Co.
Cincinnati	Ohio River Rfg. & Terminal Co.; Eureka Oil Co.; Hall-Rattermann; Merchants Oil Co.
*North Bend, O.	Gulf Refining Co.

OHIO RIVER—Louisville District

*Louisville	Stoll Oil Rfg. Co.
*Louisville	Louisville Rfg. Co.
Louisville	Gulf Refining Co.
Louisville	Aetna Oil Co.
Louisville	Standard of Ky.
*Above Owensboro	Producers Pipe Line Co.
Above Owensboro	Standard of Ky.
Evansville	H. F. Koch Stations Co.
Paducah	Three Rivers Oil Co.
Paducah	Gulf Oil Co.
Paducah	Standard of Ky.

CUMBERLAND RIVER—Nashville District

Nashville	Apex Oil Corp.
Nashville	Pure Oil Co.
Nashville	Standard Oil Co.
Nashville	Gulf Refining Co.
Clarksville, Tenn.	Standard Oil Co.
Clarksville, Tenn.	Gulf Refining Co.
Clarksville, Tenn.	Apex Oil Corp.
Dover, Tenn.	Apex Oil Corp.

MUSKINGUM RIVER

Marietta	Sinclair Refining.
Marietta	W. H. Clark.
Marietta	Standard Oil Co.
Lowell	Wm. Detlor.
Beverly	L. M. Webster.
Beverly	Beverly Ice Co.
Beverly	Drive-In Filling Station.
Malta	Standard Oil Co.
McConnelsville	Standard Oil Co.
McConelsville	Twin City Garage.
Zanesville	Quaker State Oil Co.

*Shipping points only.

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GMC Dual Performance Saves Gas, Oil, Time *and* Wear!

"One of the few major truck improvements of the past ten years," says one operator! "In our operations dual performance works out to perfection," says another! And from still another user: "Does more work with less gas".

Think of saving as much as 28% on gas. Think how much lower upkeep expenses will be because of reduced wear and tear on engine and other driving units. And in addition to these important savings, the GMC Dual Performance axle assures more effective use of power—the truck will climb a steeper grade, travel faster on the level and handle full loads easier. Too, Dual Performance gives better pick-up in traffic, which in combination with greater speed and power, reduces running time, enabling the truck to do more work per day.

Get all the facts about GMC Dual Performance—available in the 1½-2 ton and 2-3 ton ranges. Learn, too, the many other reasons why profit-minded operators are swinging to the many-feature GMC trucks of value. Whatever your hauling needs may be, there's a correctly engineered GMC truck or truck-with-trailer to fit exactly. Capacities range from 1½ to 22 tons.

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THE TRUCK GMC OF VALUE

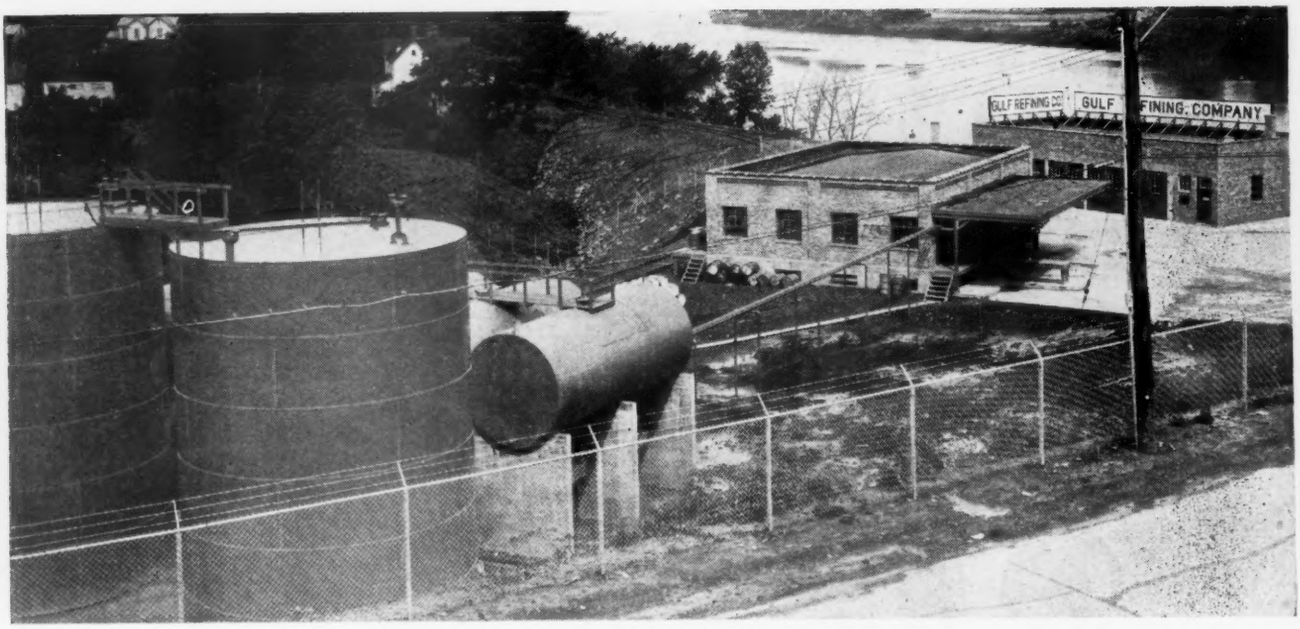


Fig. 1—Water bulk plant of the Gulf Refining Co. at Parkersburg, W. Va., where the Kanawha joins the Ohio river

as an emergency supplying means. Highways are also usually nearby to provide for trucking from the plant, although many ship by tank car only to distributing centers and others distribute by truck only. Fig. 1 illustrates a terminal using water, railroad and truck transportation.

One case was reported of a bulk plant on the river bank where river transportation was an afterthought but which has now been developed to large proportions. This is the Pure Oil Co. plant at Cincinnati, one of the most complete distributing centers on the Ohio River built at no expense to the company, i.e., it was built from difference in valuation of property which is now the site of the new Cincinnati railway terminal and the present site of the plant which was made available to the company by the city when the former site was condemned.

Docking facilities on the river are a comparatively simple matter, the draft of the largest barge being relatively small. Pipelines leading down the banks of the river may have three or four valves for attaching hose lines for different water levels. Some prefer floating docks to allow for changing water levels. A dock of this kind may be simply an old barge tied up to the bank. In any case the pipeline down the bank must have the three or four valves and operators are learning to put these valves parallel with the ground to prevent their being knocked off by floating debris during high water.

If need be it is not even necessary to have a dock. The "tow" may be anchored out from shore and the hose floated out to be attached to the pumps.

Tanks which are close to the river have unusually high dykes built around them to serve the double purpose of preventing the spread of fire and the floating away of the tanks. Two instances in which dykes were too low were called to the attention of the author and in each case considerable damage resulted when water surrounded the tanks.

The ownership of barges is divided between oil companies and towing companies. Generally the business of towing barges on the river is considered a separate business with its own problems, which are far removed from the oil business and therefore oil companies usually leave it in the hands of river men. The expense and investment in barges is not a small item, $20,000 being in the neighborhood of the cost of a 4000-barrel capacity barge. This restricts their ownership to those whose throughput is sufficient to keep them in nearly continuous operation.

Smaller companies may lease barges from towing companies as needed and rates will depend upon the convenience, among other factors, with which the shipments may be handled.

A large tow is shown in Fig. 3, a steam powered towboat pushing six oil barges. Their speed is not great, particularly when under load and traveling upstream. The author in a walk, passed one going upstream at Cincinnati. Better time is made downstream. The time for a round trip from Good Hope, La., to Pittsburgh is said

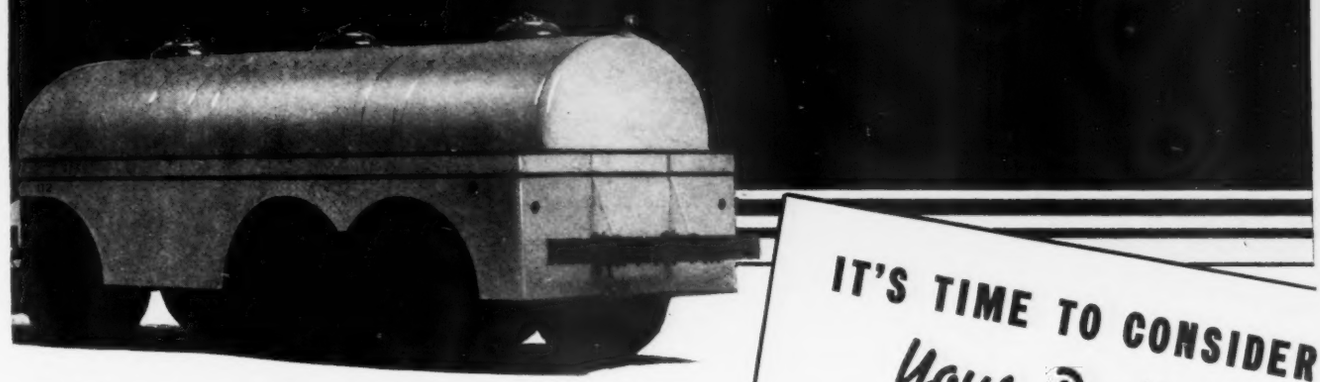
Movement of Petroleum Products on the Ohio River and Tributaries in 1928 and 1933

(Figures are in barrels)

	Pittsburgh District		Huntington District Kanawha River		Cincinnati District Ohio River	
	1928	1933	1928	1933	1928	1933
Gasoline	153,300	2,111,300	207,100	828,100	772,400	5,852,900
Fuel, gas oil	31,300	293,100	.....	.....	.....	409,100
Kerosine	48,400	.....	.....	.....	.....	188,500
Unclassified	7,100	7,300	10,200	2,500	12,300	38,600
Crude oil	.....	.....	.....	.....	1,375,000	793,300
Total	240,100	2,411,700	217,300	830,600	2,159,700	7,282,400

ADVERTISING PAGES REMOVED

...What then?



Like the_____Company, they have found that Fruehaufs stand for bottom-dollar haulage.

DOUBLE SAVING POSSIBLE

Companies, both large and small, are showing 30% to 50% savings with Fruehauf Trailers over any other method of land transport. And, in many cases, a *double saving* is possible where delivery is made direct to major oil stations and re-handling of the load is eliminated.

It does pay to study the figures. Your transportation set-up may seem satisfactory without Fruehaufs. But it's worth the investigating—just to make *sure* that you are getting every possible saving.

Use the coupon below. It will bring to your desk an experienced Fruehauf Transportation Engineer. He is interested in applying Trailers only where they will show a satisfactory saving. The services of this man, and the facilities of our entire Oil Division, are available to you without obligation.

Oldest and Largest Manufacturers of Trailers

FRUEHAUF TRAILER COMPANY, *Detroit*

Sales and Service In All Principal Cities

Direct delivery is possible with Trailers. Many bulk plants eliminated. No time lost rehandling load.

TRAILERS

IT'S TIME TO CONSIDER *Your Budget*

FRUEHAUF Trailers are not offered as a general "cure-all" for the oil executive's troubles. But they *will* do this—substantially reduce your "transportation" appropriation while increasing your haulage facilities.

"Buying Fruehaufs not only allowed us to carry out our original program, but to do it with a considerably smaller appropriation," says the transportation head of a large eastern oil concern.

The head of another company puts it this way: "We were faced with a greatly reduced budget. Frankly, we were at a loss as to how we were going to go ahead with our transportation plans. We knew very little about Trailers, but did feel that we couldn't afford to overlook any possibilities.

"Your man convinced us they were worth trying, and we bought two at first, more or less as an experiment. We have added 16 since. You will be interested in knowing that they have all performed exactly as your representative said they would."

These actual experiences of oil men are typical of Fruehauf users. They will tell you that buying Fruehauf Trailers is stretching your transportation dollar to its fullest value.

It's time to consider *your* budget. Very probably Fruehauf Trailers can be of help. If you are not already a Fruehauf user, we suggest you investigate their cost-cutting possibilities now.

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FRUEHAUF TRAILER COMPANY
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Gentlemen: We are interested in learning, without obligation, what cost-cutting possibilities Fruehauf Trailers have for us.

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City_____ State_____

Fig. 2—A small river bulk plant at Kittaning, Pa., on the Allegheny River. Note the concrete walls surrounding the tanks. Earthworks are more common

to be around 30 days. However, there are occasions when barge shipments can save time over other transportation methods, Atlantic Refining Co. officials claim. For local transportation, geared to towing company schedules, the time savings is an important item.

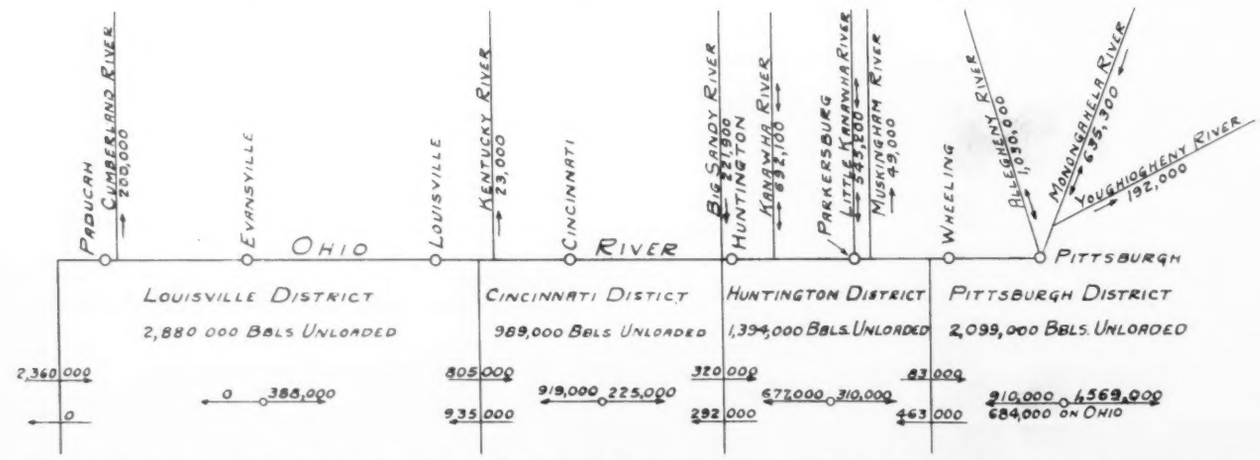
Several types of barges are in use on the river, with capacities ranging from 2000 to 7000 barrels. Size is limited by the river's depth particularly on tributary streams, and the dimensions of locks. The standard sized Ohio River lock is 110 by 600 feet, but on tributary streams there are locks 52 by 280 feet and 40 by 200. These will eventually be replaced by a standard sized lock 60 by 300 feet, approximately half the dimensions of the Ohio River locks. Barges just wide enough to pass two abreast through the larger locks and long enough to allow four barges in the lock obviously would require a much longer time to pass through the smaller locks.

A barge designed especially for petroleum products usually has four or five compartments extending from side to side and bulkheads at each end as a protection against leakage in collision. Pumps and power equipment for unloading are standard equipment. The booms on the six barges in Fig. 3 facilitate speed in making pipe connections for discharge of cargo. Expansion and access trunks are shown on the decks. Quarters for one or two members of the crew and space for tools and apparatus are contained in the deckhouse.

While the barges pictured are commonly used for shipping petroleum products there are others which may be simply barges originally intended for gravel, sand, or coal, in which there have been built several cylindrical tanks either permanently or so that they may be removed if the barge is needed for other purposes. Others may be built in such a manner as to keep water over the deck to cut evaporation losses. Still others, particularly those owned by towing companies, have deck houses which cover the entire deck and may be used for other cargo.

Four types of power are used to operate barge pumps—steam, kerosine engines, gasoline engines, and electric motors. Opinion is varied as ot the advantages of each. When the towboat is operated by steam, its convenient accessibility is advantageous and free from fire hazard, its advocates claim. Electric power is also favored for its low fire hazard when electricity can be supplied from shore though some point out the danger of electric sparks. Gasoline and kerosine engines

Movement of Petroleum Products on Ohio River and Tributaries



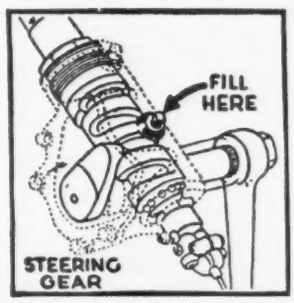
Movement of gasoline on the Ohio River and its tributaries in 1934. Volumes originating in each district and volumes passing from each district to adjoining districts are indicated in barrels by figures over the arrows. Distances between principal cities, tributary rivers, and district limits are scaled to river mileage along the Ohio. Figures on tributary streams indicate total volume moving in both directions. Arrows above figures indicate portions of this volume are confined to the tributary alone

CALLING ALL CARS!....CALLING ALL CARS! THREE PEOPLE KILLED ON HIGHWAY 40 BY CAR WITH BROKEN STEERINGWHEEL!

Wouldn't it make cold chills run down your spine to think what might happen if the steering gear of your automobile suddenly gave way and you had no direction control? Especially so if you were in heavy traffic. That is exactly what is apt to happen if the steering gear is not greased frequently enough with the proper type and grade of Steering Gear Grease.

City driving, particularly, requires instant response, at all times, of the steering gear. Many times an accident is averted by swerving quickly to right or left. Women drivers, especially, like a car which steers easily and thus has a high safety factor.

Whenever an automobile is being operated the steering gear mechanism is constantly moving. They are so constructed that high pressures are placed on the bearing surfaces. That means the best Steering Gear Grease must have E. P. (Extreme Pressure) properties and thus be capable of preventing metal to metal contact, regardless of the load developed in service. Further, it must be properly manufactured, using a well refined lubricating oil so that it will have the desired durability. In winter a Steering Gear Grease must be used which will not have its consistency changed appreciably by the cold weather. If the grease gets stiff the steering mechanism will be hard to operate and accidents may result.



Correct greases decrease wear and make your steering gear respond quicker, easier

Protect yourself by using correct lubricants, correctly applied.

BATTENFELD

GREASE & OIL CORP., KANSAS CITY AND MINNEAPOLIS

may, of course, use fuel carried on the barge and are also safe in operation when properly handled. Centrifugal and rotary pumps are in common use both on barges and at the bulk plants.

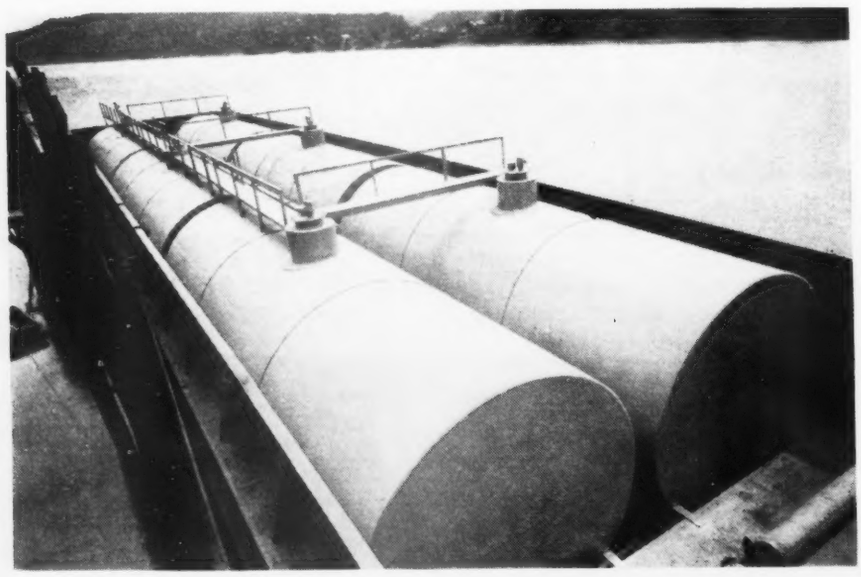
As yet the most common type of towboat is powered by steam and moved by rear paddle wheels. Such a one is shown with the six barge tow illustrated. There is a present tendency in the direction of diesel power, however, and the most modern towboat is motivated by screw propellers. The Union Barge Co., Pittsburgh, has put two of these in service within the past year. These towboats are all-steel, with ship-shaped hull 160 feet long, 34-foot beam and depth of 7 feet, 9 inches. Their two propellers are 5 feet 5 inches in diameter and powered by two Winton diesel engines developing a total of 750 horsepower.

Gasoline is the principal petroleum product barged on the Ohio River, being in the neighborhood of 90 per cent of the total volume or more. Some crude oil is barged, chiefly from above Owensboro, Ky., from the Producers Pipe Line Co. terminal to the Louisville Refining Co. In 1934 the volume of crude oil originating in the Louisville district, according to government statistics, amounted to 1,612,000 barrels, of which 286,600 barrels was moved into the Cincinnati district and the remainder reached destinations in the Louisville district.

A rough idea of the volume of gasoline barged on the Ohio may be obtained from the accompanying chart. In the Louisville district the Stoll Refining Co. and Louisville Refining Co. are the principal shippers of gasoline by barge. The Ashland Refining Co. and Gulf Refining Co. load gasoline on barges in the Cincinnati District. Apparently the outbound gasoline from the Little Kanawha River originates from the Standard of New Jersey refinery at Parkersburg and outbound figures on the Kanawha River indicate Pure Oil Co. shipments. Ashland Refining Co. is the only known source of outbound gasoline on the Big Sandy River. Atlantic Refining Co. is the only shipper on the Allegheny River and Gulf. Standard of New Jersey, and Sun Oil Co. originate traffic on the Ohio in the Pittsburgh district. The difference between 684,000 and 463,000, which is 221,000 barrels, is the volume of gasoline which is unloaded between the Neville Island refinery and beyond Wheeling about 20 miles on the Ohio.

• • •

Cylindrical tanks replace the conventional construction in this new gasoline barge. There are 6 tanks, each with a capacity of 50,000 gallons. The tanks are located on saddles so that the entire surface is accessible for inspection at all times. Products are pumped out at the bottom of the tanks. The barge was recently put into service by the American Barge Line Co., of Pittsburgh, Pa. Photo courtesy Bethlehem Steel Co.



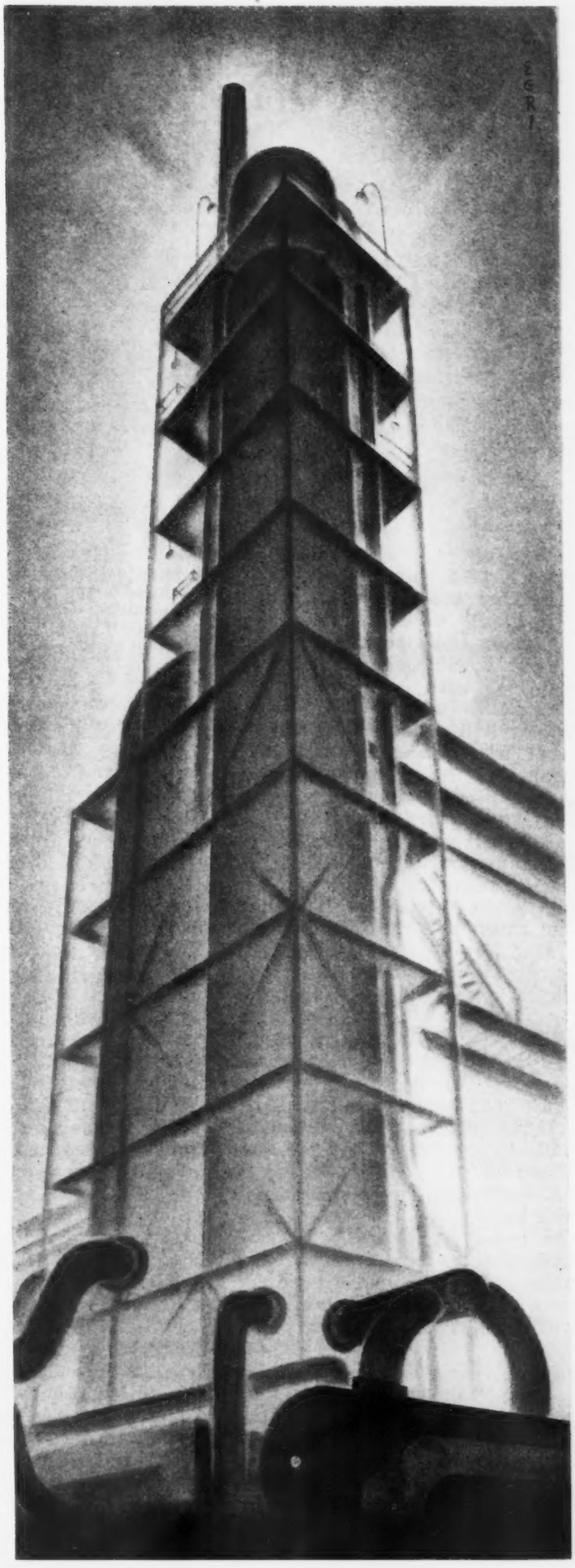
The cost of barging petroleum products varies widely and is highly competitive. For the same haul prices of 80 cents per ton and $1.25 a ton have been paid by one company at the same time, it is said. Prices vary with distance, direction (upstream or downstream) number of locks passed through, and volume of shipments. There is no control of prices by an interstate commerce commission as on rail rates. From one source the estimate of ⅛-cent per gallon per 100 miles (5.25 cents per barrel) has been made for river transportation of quantities ranging from 5000 to 10,000 barrels.

A typical example of difference in costs is a reported $107 per car from Pittsburgh to Brownsville, Pa., 56 miles up the Monongahela River, and $150 to tow a 22-carload barge. The following table is merely a hypothetical bid on barge shipments from Donora, Pa., on the Monongahela. Lower prices can be obtained and there are higher prices asked for the same hauls or similar hauls, it is said. However, the figures give an idea of the order of magnitude of charges for short hauls.

Rate Per Ton of Gasoline (7.2 Barrels)

From Donora to	Mileage	1 Barge	1000 tons or more
Fairmont, W. Va.	90	50c	45c
Morgantown, W. Va.	64	40	35
Nemacolin, Pa.	41	25	20
Brownsville, Pa.	20	15	10
W. Elizabeth, Pa.	13	10	....
McKeesport, Pa.	21	10	....
Pittsburgh	36	25	20
Millvale	48	25	20
Oakmont, Pa.	73	30	25
Kittanning, Pa.	82	45	40
Templeton, Pa.	91	50	45
Coraopolis, Pa.	47	30	25
Rochester, Pa.	61	35	30
Steubenville, O.	97	45	40
Wheeling, W. Va.	126	70	65

If it were not for the possibility of shipping up the Mississippi and Ohio Rivers, it would still be cheaper to ship around to the Atlantic Coast by tanker and from there by rail than to ship the whole distance by rail, authorities state.



KELLOGG COMBINATION CRACKING UNITS REDUCE OPERATING AND INVESTMENT COSTS

The large Kellogg combination topping and cracking units completed and under construction are excellent examples of reducing the cost of gasoline through the application of research and knowledge.

The multiplicity of operations formerly considered necessary in an efficient refinery have been reduced to the confines of a single unit.

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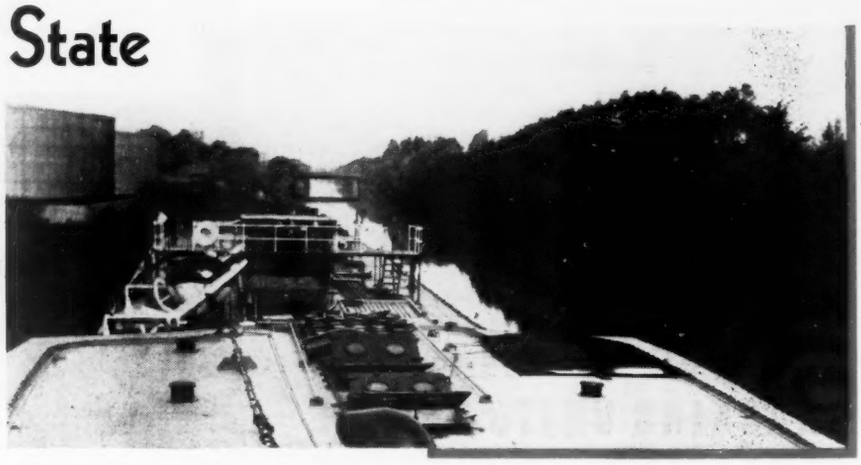
12,000,000 Barrels of Oil Shipped in 1934 On New York State Barge Canal



A "ship's-eye" view of the Erie Canal at Utica, N. Y. This barge is of the self-propelled type, powered by diesel engines. It is unloading at the marine terminal of the Burgess Oil Heating Corp.

By John W. Thompson
N. P. N. Staff Writer

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TO THE layman, the New York State Barge Canal is simply a slit of water that connects the Great Lakes with the Atlantic Ocean. That conception, with qualifications, is true. But that "slit" of water, in its 525 miles of wandering over the state of New York, manages to pass through a number of thriving communities, small towns and full-grown cities that use their share of petroleum products.

According to official records, the first company to operate on the canal was the Standard Oil Co. of New York, in 1918. With one tug, one motorship, and eight barges, this company operated between Albany and Whitehall, a distance of 70 miles, and between Albany and Syracuse, about 150 miles.

In 1925 the movement of petroleum products on the canal had increased to 322,141 net tons and last year witnessed 22 different brands of petroleum and its products transported on the canal by over 100 barges and motorships. The net tonnage of petroleum products moved on the canal last year was 1,698,731, or more than five times what it was ten years ago.

Last year petroleum and its products represented 41 per cent of the total tonnage carried on the state barge canal system. The second largest tonnage commodity was grain, with 22.5 per cent.

Thus we see that this "slit of water" handled approximately 1,700,000 net tons of petroleum products last year alone. Reduced to oil men's language, this means nearly 12,000,000 barrels. With the navigation season last year opening April 16 and closing December 9, it meant that this tonnage was carried in a period of 238 days.

The barge canal system in New York state comprises five divisions. The Erie canal, which extends from Waterford at the Hudson River on the east and Tonawanda at the Niagara River on the west, is 339 miles long. This division handles the major part of the petroleum traffic, serving such centers as Albany, Schenectady, Utica, Syracuse, Rochester, and Buffalo.

The Oswego canal extends from Three Rivers Point on the Erie Canal to Lake Ontario, and is 24 miles long.

The Cayuga-Seneca canal extends from its junction with the Erie Canal to Ithaca and Watkins, including Cayuga and Seneca Lakes and a spur to Montour Falls. This division covers 92 miles.

The Champlain canal serves the northeastern section of New York, running from Waterford to Whitehall, a distance of 60 miles. This division reaches to Lake Champlain, through which carriers may pass to the St. Lawrence river.

The fifth division of the barge canal system is made up of the canal harbors at Utica, Syracuse and Rochester. These harbors add 10 miles to the system. There are 57 locks in the entire canal system, and a total of 309 rail and highway bridges cross the canals.

Approximately 95 per cent of the petroleum traffic on the canals is westbound, that is, it is headed toward Buffalo or up through the Champlain canal, or down through the Cayuga-Seneca division.

Ocean tankers are able to come up the Hudson river as far as Albany, which makes this port a particularly active one in the canal system. Both at Albany and at Rensselaer, which is just across the river, are to be found the water terminals of many oil companies. These serve as transfer terminals where ocean tankers unload into storage tanks. From these tanks the products are loaded into barges for the trip through the canals.

Thus tankers coming from the west coast, the gulf ports, and the east coast are able to pull up to the "front door" of the barge canal. Cargoes com-

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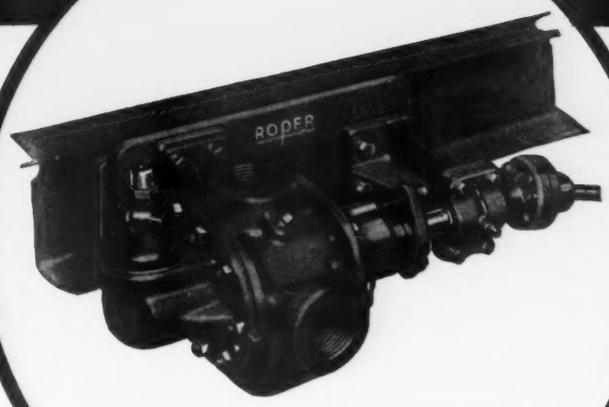

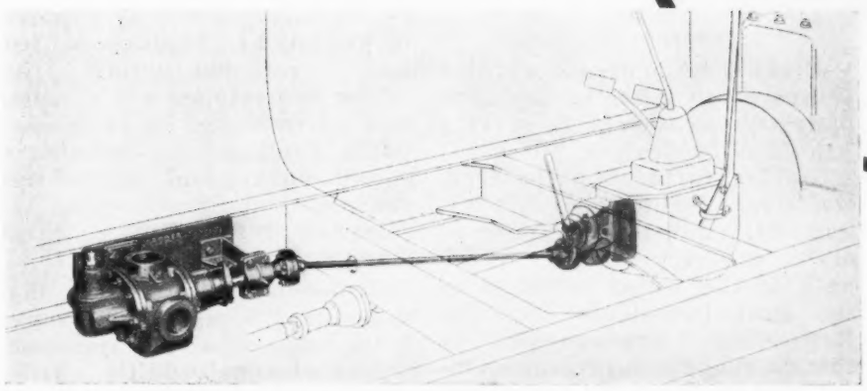

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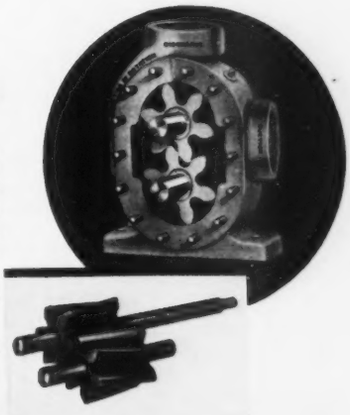

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Company.....

Individual.....

City..... State.....

An oil barge unloading at the Rome, N. Y., terminal of the H. P. Sears Oil Co. terminal on the Erie Canal. A barge of this type will carry about 450,000 gallons. Pumps driven by steam which is supplied by the tug that tows the barge are capable of unloading at the rate of 54,000 gallons per hour

ing from Bayonne and other ports in the vicinity of the New York harbor, and which are to enter the canal, are normally sent up the Hudson river in self-propelled or tow barges, so that they need not make the transfer before entering the canal.

On the Hudson river, between Albany and New York, are numerous water terminals. From practically all of these terminals shipments are made to inland points by truck and rail.

Most of the terminals along the Hudson river and the barge canals are the property of the major oil companies. However, there are some excellent examples of independently owned and operated water terminals in this highly populated area.

Stopping at Athens, N. Y., on our way up the Hudson toward the canal entrance, we find the 2,000,000-gallon storage facilities of the Amos Post Estate, distributors of Standard Oil Co. of New Jersey products. This company has nine storage tanks, the largest of which is 750,000 gallons capacity, and the smallest 20,000 gallons. Under the present facilities 1,000,000 gallons of fuel oil can be stored, in addition to 500,000 gallons of kerosine and 500,000 gallons of gasoline.

This company also maintains two nearby rail terminals, at Catskill and Saugerties. These terminals are supplied direct from the refinery by tank car and from the Athens water terminal by tank truck. During the navigation season fuel oil, kerosine and gasoline are barged to the Athens terminal from Bayonne, N. J.

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Eight trucks operate within a radius of 40 miles of the company's three terminals, serving 125 gasoline dealers.

Moving further up the Hudson river, across from Albany, and in the midst of a number of major company transfer terminals, is the water terminal of the Port Petroleum Corp. at Rensselaer. Headquarters of this company are in Schenectady. This company, an independent distributing its own brand of gasoline, receives its supply from the New York harbor by barge. Four tanks are used to store the products, with capacities as follows; 1,000,000 gallons for fuel oil, 500,000 gallons for gasoline, and a 10,000 and 20,000-gallon tank for kerosine.

Five trucks operating out of this terminal serve Albany, Schenectady, Amsterdam and Saratoga. From this water terminal about 25 fuel oil and kerosine peddlers receive their supply.

Moving into the Erie canal heading west terminals soon begin to appear, indicative of the intensive use of the canal system by the major oil companies. Standard, Shell, Sun, Colonial Beacon, and The Texas Co., all have strategically spotted terminals along the canal system.

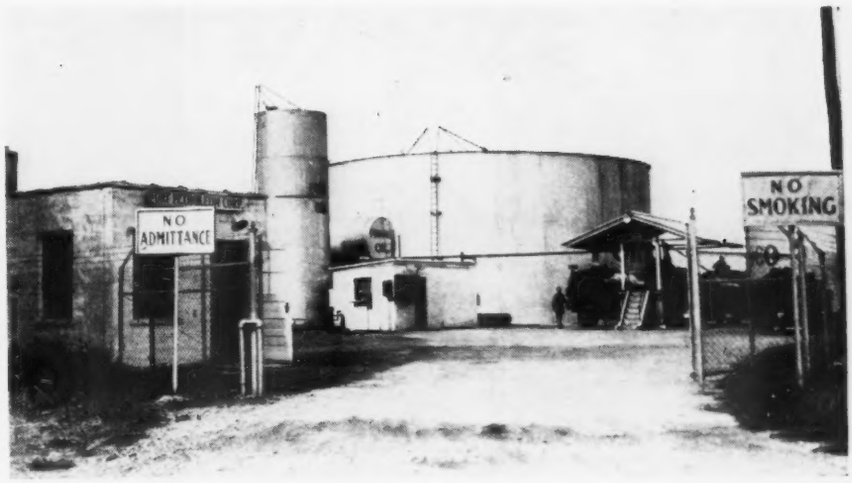
In Utica, literally surrounded by major company terminals, is the canal terminal of the Burgess Oil Heating Corp., with a capacity of 6,000,000 gallons. This independent company has enjoyed a steady growth during the few years it has been in business. Besides its local fuel oil business, which is supplied by five trucks, the Burgess plant has a railroad siding, from which are shipped out gasoline and kerosine on a wholesale basis. Products are bought on a spot market and shipped into the plant on barges which the company rents from a barge transport concern.

This company finds, too, that it receives a sizeable revenue from some of the major companies who need additional storage from time to time and who rent tankage from Burgess for tneir surplus supply. This warehousing feature of the Burgess operation is paid for on a throughput basis and represents a fairly steady and profitable income. The company plans to erect additional tanks soon which will be used partly for this purpose.

In Rome, N. Y., The H. P. Sears Oil Co., Inc., is an interesting example of the Independent marketer who uses water transportation. Sears buys his products direct from the refiner in California or Texas, contracts for an ocean tanker to move his goods to the New York harbor and there transfers the cargo directly from the tanker into barges which are towed to his plant in Rome.

The plant has a total capacity of 6,400,000 gallons, of which 3,200,000 is gasoline, 3,100,000 fuel oil, and 100,000 motor oil. The tanks are located in such

A view of the 1,580,000-gallon water terminal of the Port Petroleum Corp. on the Hudson river at Rensselaer, across from Albany. Fuel oil, gasoline, and kerosine are metered into trucks at the loading rack



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a way that all the fuel oil and motor oil storage is grouped separately from the gasoline storage. The two groups of tanks are 300 feet apart, with the result that Sears has been able to cut his insurance rate half.

The ocean tankers that bring the Sears cargo to New York harbor average about 3,000,000 gallons capacity. The barges into which the tankers unload for the trip up the canal each carry about 450,000 gallons. Pumps on the barges are capable of unloading at the Sears plant at the rate of 54,000 gallons per hour.

The Sears Co. distributes its products under its own brand name and serves the Rome, Utica, and Ilion territories. All of the company's fuel oil trucks are marked in large letters to indicate the type of oil they carry. Thus range oil trucks carry only range oil, and similarly for the other grades of fuel oil. This feature is stressed in the company's literature, which states that "one half gallon of furnace oil in 50 gallons of range oil will badly soot any gravity feed burner, and one-half gallon of gasoline in any grade of oil might be disastrous". All fuel oil trucks are metered.

As we move westward along the canal it becomes increasingly evident that the major companies are playing to the limit the distribution possibilities of the canal system. All the larger centers along the route have their quota of major company terminals. Syracuse, with one exception, is typical of other cities along the canal as far as distribution operations are concerned. The exception lies in the fact that the Sun Oil Co.'s pipeline from Marcus Hook terminates at Syracuse. Gasoline received at the Sun terminal through this pipeline is placed in barges and sent as far as Utica on the east and Lake Erie ports on the west. Tank car and truck shipments also leave this terminal for inland points.

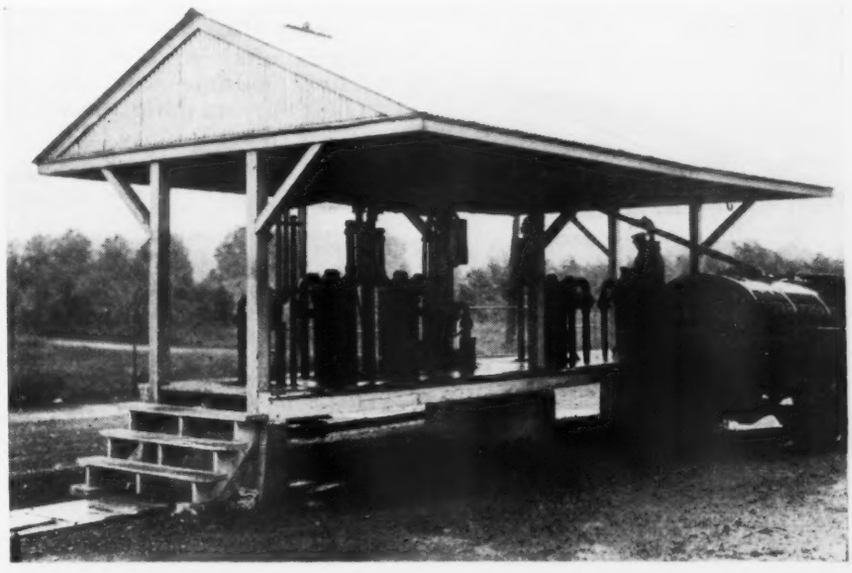
A review of the other large company operations at Syracuse may be of interest. The Atlantic Refining Co. receives gasoline by ocean tanker at its transfer terminal at Rensselaer, then ships by barges to Syracuse. From here central New York state is covered by truck and rail. The point of origin of the gasoline is Point Breeze or Newark.

Cities Service receives its regular gasoline by barge from Perth Amboy, N. J. Its third grade comes by rail from Titusville, Pa. It ships out of Syracuse by truck to Rome, and by rail to Cortland, Auburn, Weedsport, Pulaski, Watertown, and Savannah.

The Gulf Refining Co. receives its gasoline from Gulfport at Staten Island by barge. At Syracuse all products are sold by dealers. Rail shipments are made from the terminal to Cortland, Binghamton, Elmira, Watertown, Lamson, and Baldwinsville.

The Pure Oil Co. receives its regular gasoline through the Sun Oil Co. pipeline from Marcus Hook. It distributes by rail and truck to surrounding points.

From California and the Gulf ports, Shell Eastern's gasoline comes in ocean tankers to Rensselaer, where it is unloaded into a transfer terminal to await loading into barges for canal points, including Syracuse. Inland points from Syracuse are served by rail and truck. Shell has a large terminal at Sewaren, N. J., where products are often stored to await further shipment along



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All products leaving the truck loading rack at the H. P. Sears Oil Co. water terminal in Rome, N. Y. are metered

Map of Hudson river and New York State Barge Canal system showing location of oil terminals

• • •

the coast and into the canal system.

Colonial Beacon's terminal at Syracuse is supplied originally from Bayonne. From this point the cargo is brought to a transfer terminal at Albany, from which point it is barged to Syracuse. Ithaca, Oswego, Fulton, and Cortland are served from that terminal by tank car.

The Socony terminal receives its Syracuse supply in a similar manner to Colonial Beacon.

Sinclair barges all its gasoline into Syracuse from Trembley Point, N. J. It is received at the Richfield terminal and all distribution from that point is local.

All grades of The Texas Co.'s gasoline come from Port Arthur, Texas, by ocean tanker to Albany or Kingston on the Hudson river. From this point regular gasoline is barged into the canal to Syracuse. Third grade and Ethyl gasoline is shipped from Albany and Kingston by rail to neighboring towns.

Richfield ships from Bayonne to Syracuse by barge and out of Syracuse by rail and truck.

Tide Water ships from Bayonne by ocean tanker to Rensselaer, where the cargo is transferred to storage and reloaded into barges for Syracuse and other canal points. The Syracuse terminal serves inland points by rail and truck.

It should be remembered that these details of movements are given for Syracuse only to illustrate how the companies operate. These companies have similar operations at other points along the canal also.

In Rochester is located the new canal terminal of the Doyle Gas & Oil Co., an independently owned concern marketing a major company's products to 17 company owned stations and about 600 dealers. There are 11 trucks operating out of this terminal, which travel within a 50-mile radius of the plant.

The terminal, in which Doyle and the supplying company both have an interest, has a total capacity of 6,846,000 gallons. There are 5 tanks, the largest having a capacity of 3,360,000 gallons and the smallest 273,000 gallons.

Throughout the barge canal system, water transportation of petroleum products has come into such general use that retail gasoline prices are based on the shipping rate by water in almost all instances. Major oil companies in many cases have contracts with their distributors on a delivered price or a marginal basis. In these cases the jobber has little chance to realize any saving which water transportation affords, for any profit due to water shipment under this contract arrangement nets back to the refiner.

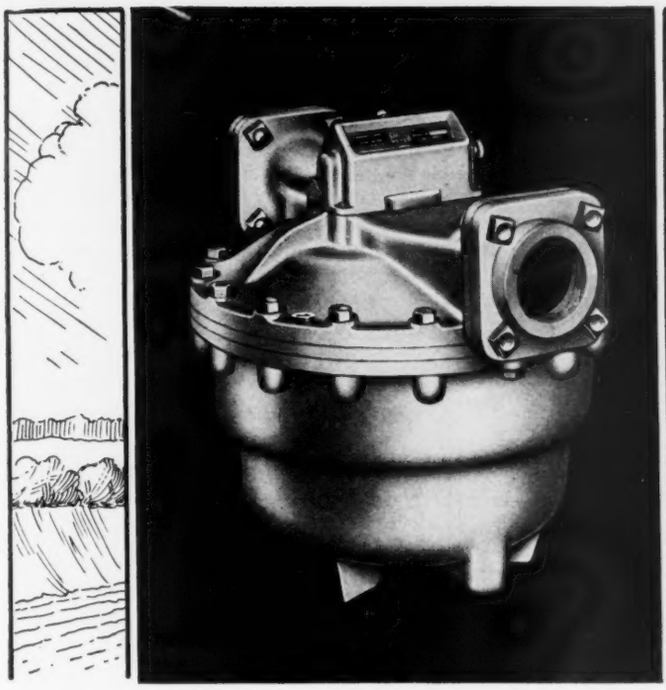
In spite of this fact, however, some jobbers having a sufficient volume of business to warrant a water terminal have gone ahead and constructed one feeling that there would be a sufficient saving through the reduction in handling loss to make it pay its way, without the benefit of any saving that might have come in the water freight rate.

Some jobbers with an impressive gallonage have been fortunate enough to make a deal with their supplying companies whereby the jobber would build the water terminal which he would use for his own base, and in addition permit his supplying company to use it as a storage terminal for its own operations in that district, for which accommodation the supplying company would pay the jobber a throughput rate of 0.25 cent per gallon on everything that went through the terminal, including the ojbber's own requirements.

In this way the jobber has the benefit of a water terminal economy to the extent of 0.25 cent on all gallonage. For the jobber whose contract specifies a refinery price plus shipping and who is free to choose his method of shipment, a saving in transportation cost can often be realized if he will contract a barge to pick up his supply at

Origin and volume of shipments entering the New York State barge canal system in 1934 (Where volume was less than 35,000 barrels point of origin is not tabulated)

From	Barrels
Albany	5,206,712
Bayonne	1,011,836
Bayway, N. J.	168,105
Buffalo	473,942
Carteret, N. J.	37,366
Kingston	1,025,318
Newark, N. J.	433,223
Newburgh	69,972
Perth Amboy	62,279
Philadelphia	106,512
Rensselaer	128,303
Saugerties	384,216
Sewaren, N. J.	1,039,304
Staten Island	677,607
Syracuse	570,220
Tremley Point, N. J.	326,466



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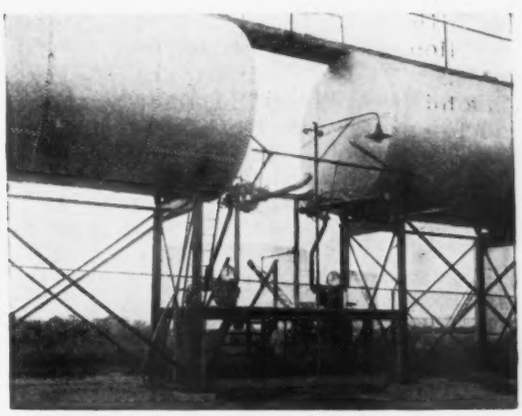

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List of Water Terminals on the New York State Barge Canals

(including Hudson River)

Location	Companies
Peekskill	Tidewater, Sun.
Newburgh	Tidewater, Sun.
Milton	Shell.
Poughkeepsie	Sun.
Kingstown	Tide Water, Sun.
Catskill	Tide Water.
Hudson	Pulver Oil Co.
Athens	Amos Post Estate.
Albany	Colonial Beacon, Socony-Vacuum.
Rensselaer	Texas, Tide Water, Sun, Shell, Gulf, Cities Service, Atlantic, American, Port Petroleum.
Troy	Hartol.
Port Henry	Gulf.
Burlington, Vt.	Shell, Gulf.
Schenectady	Shell.
Amsterdam	Socony.
Little Falls	Socony.
Fonda	Socony.
Fort Plain	Socony, Texas.
Ilion	Richfield.
Utica	Sun, Shell, Socony, Burgess, Sinclair, Colonial Beacon, Texas, Tide Water.
Rome	Sun, Sears, Z. & M., Socony.
Syracuse	Atlantic, Cities Service, Gulf, Hartol Pure, Shell, Colonial Beacon, Socony, Sinclair, Texas, Richfield, Tide Water, Sun.
Fulton	Socony.
Oswego	Socony.
Seneca Falls	Socony.
Clyde	Petroleum Wholesale.
Newark	Sun.
Rochester	Petroleum Wholesale, Richfield, Texas, Socony, Sun, Gulf, Shell, Colonial Beacon, Tide Water.
Medina	Sun.
Buffalo (Tonawanda)	Petroleum Wholesale, Sun, Shell, Texas, Colonial Beacon, Socony, Frontier Fuel Oil.

the refinery and transport it to his terminal.

One of the secrets of the saving brought about through water transportation is that it costs little more to barge 500,000 gallons than it does 200,000 gallons. Thus a distributor with a business that will support ample water storage facilities is in a position to profit considerably by water transportation.

The independent jobber who buys on the spot market and resells through his own outlets under his own brand name is at the present time in the best position to profit by water transportation. If his volume is large enough, he can charter an ocean tanker to bring his cargo from the refinery. He can rent storage tanks at strategic points to hold these products until he can obtain a good barge rate to bring the goods to his own terminal, and he can rent the services of a tug and barges to bring his shipment through the canal. The jobber today has at his command all of the water terminal and shipping facilities of the major companies, but without the overhead burden.

However, the road to saving through the use of water transportation is not entirely closed to the jobber handling a major brand product. If the jobber is located on the canal, for instance, he may find a way to save money through this form of shipment.

A good example is a jobber in Ft. Plain, N. Y. He distributes a major brand product to 15 company owned stations, 85 dealers, and about 600 fuel oil accounts. He now is buying his products at the price posted at the supplying company's Albany transfer terminal and he has to pay the rail freight from there to Ft. Plain, a distance of about 60 miles.

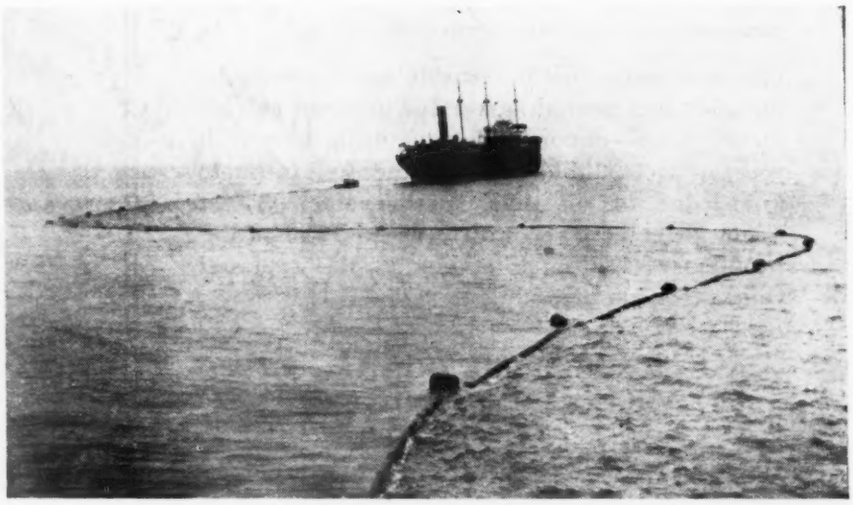
He has found that ,even after a drastic cut in the rail rate between these points, he will be able to save money by barging his supplies from Albany. Consequently, next spring he will build a water terminal at Ft. Plain and charter a barge at Albany to bring his supply up the canal.

A glance at the barge and rail rates from New York harbor to a point up the Hudson river and to a town on the Erie canal shows the saving that water transportation affords. From Bayonne, N. J., to Catskill, N. Y. on the Hudson river the rail rate is 1.39 cents per gallon, while the rate by barge is only 0.24 cent per gallon, or about one-sixth of the rail rate. For the jobber with water terminal facilities this means a saving of over one cent per gallon.

From New York harbor to Rome, N. Y., on the Erie canal, the rail rate for transporting petroleum products is 1.75 cents per gallon, while the rate by barge up the Hudson river and through the canal is only 0.68 cent per gallon.

Barge rates to some of the points on the New York state barge canal system indicate the economy to be found in this method of shipment. From New York harbor, the barge rate to Utica is 0.6 cent per gallon; to Syracuse, 0.8 cent; to Rochester, 1.1 cents; to Buffalo, 1.25 cents; to Oswego, 0.8 cent; to Ithaca, 0.9 cent; to Watkins Glen, 1.1 cents; to Burlington, Vt., 0.8 cent; to Port Henry, N. Y., 0.8 cent; to Fort Edward, N. Y., 0.7 cent.

1200-Foot Hose Loads Tankers at Sea



The nearest large tankers can approach the docks of an oil company at one point in California is a quarter mile off shore. Oil is pumped to the ship through 1200 feet of eight-inch hose at a pressure of 100 pounds. The hose connection between dock and boat consists of 24, fifty-foot lengths floated by means of hermetically sealed oil drums. The serpentine effect is to save the additional drag on the hose due to tide wash and wind action

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Cape Fear Terminal Co.
Carter, L. O., Co.
Chalmette Petroleum Corp.
Coltex Refining Co.
Consolidated Oil Corporation
Continental Oil Co.
Cooper-Keller Oil Co.
Cosden Oil Co.
Crawford, R. R.
Cushing Refining & Gasoline Co.
Danciger Oil & Refining Co.
East Texas Refining Co.
Eastern States Petroleum Co.
Elk Refining Co.
Empire Companies
Forbes Petroleum Co.
General Oil Co.
General Oil Sales Corporation
General Petroleum Corp. of California
Globe Oil & Refining Co.
Grogan Oil Co.
Gulf Refining Co.
Gypsy Oil Co.
Hasselmann, K. F.
Hercules Oil Co.
Hurley Gasoline Co.
Imperial Refineries
Indian Refining Co.
Indian Territory Illuminating Oil Co.
Industrial Petroleum Corp.
Johnson Oil Refining Co.
Kanotex Refining Co.
Kendrick Oil Co.
Kettleman North Dome Assn.
Lederer, E. R.
Lookout Oil & Refining Co.
MacMillan Petroleum Corp.
Magnolia Petroleum Co.
Midwest Oil Co.
Mileage Gasoline Co.
Mohawk Petroleum Co.
Mona Motor Oil Co.
Moon Marketing Co.
Moore, Dale W., Oil Co.
National Refining Co.
Nueces Refining Co.
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Pacific Coast Petroleum Agency
Penn-O-Tex Oil Co.
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Refiners Petroleum Co.
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Saunders Petroleum Co.
Shamrock Oil & Gas Co.
Shell Eastern Petroleum Products, Inc.
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Shell Petroleum Corp.
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Signal Oil & Gas Co.
Sinclair Refining Co.
Socony Vacuum Oil Co., Inc.
Stahl, H. K., Co.
Standard Oil Co. of Indiana
Stanolind Oil & Gas Co.
Stephens, Ray
Stumpf, John A.
Superior Oil Co.
Tansel Petroleum Co.
Texas Co.
Texas-Pacific Coal & Oil Co.
Tidewater Oil Co.
Tiona Petroleum Co.
Transamerican Petroleum Corp.
United Refining Co.
Warner, C. H., Jr.
Western Oil & Fuel Co.
Western Petroleum Refiners Association
White Eagle Oil Corp.
Williams Petroleum Corp.
Wilcil Corporation
Wofford Oil Co.
Wood-Moore Corporation

East Chicago is Hub of Tanker Shipment Of Refined Oil on Great Lakes

A busy day on the East Chicago Waterway

OUTGOING shipments of gasoline from Indiana Harbor, located about 18 miles southeast of the heart of Chicago, outranked all other commodities by approximately one million tons in 1933.

In the wide Chicago port district which includes Waukegan, Chicago and Calumet Rivers and Harbors, Indiana Harbor, Buffington and Gary Harbors, no other commodity, with the exception of corn which was about 3600 tons greater, even approached the gasoline tonnage. Shipments of petroleum products moving through Indiana Harbor alone were more than one-third the total tonnage of all commodities shipped through the foregoing six harbors. Shipments of gasoline in 1934 showed a 30 per cent gain over 1933, government statistics show.

The development of tanker and barge transportation of petroleum products on the Great Lakes has been concurrent with the growth of shipping from Indiana Harbor. As far back as 1920, over 3,750,000 barrels of gasoline were shipped. That year the Duluth area was the principal consumer of lake-borne petroleum products, using over 10 times as much as its nearest rivals, Muskegon and Green Bay.

In 1925 gasoline shipments from Indiana Harbor had jumped to 5,267,000 barrels, Detroit had taken first place in receipts, although receiving less than Duluth in 1920, and Duluth had dropped to little more than half its 1920 volume. Muskegon was not far behind Duluth in that year.

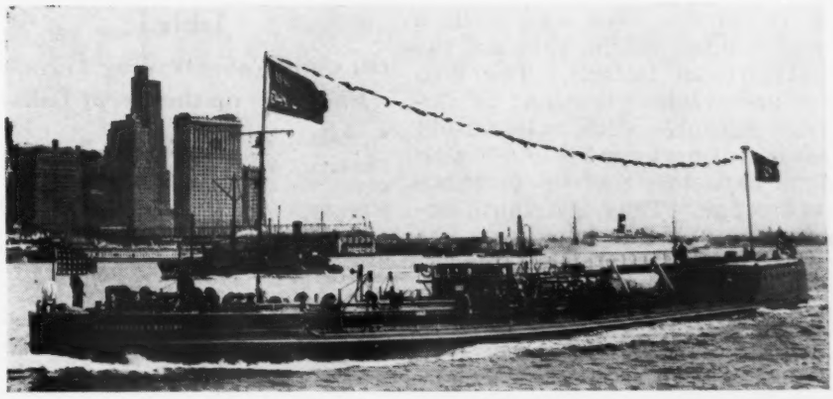
Tanker shipments of gasoline in 1929 were double 1920 volume, totaling 7,871,000 barrels. Five years later, in 1934, the total of gasoline shipments from Indiana Harbor reached 9,831,000 barrels and shipments from Toledo and Cleveland made an appreciable volume. Toledo's total was 1,010,000 barrels and 750,000 barrels went out from Cleveland. Buffalo shipped only 92,000 barrels of gasoline.

Fuel oil volume approached gasoline volume from Toledo but ranged around 10 per cent at Chicago and Cleveland. Kerosine was the only product to show a continuous and steady decline in tanker shipments since 1920. Indiana Harbor's shipments, dropping from 1,036,000 barrels to 529,000 barrels between 1920 and 1934, are again representative.

Crude oil became important in lake shipping with the development of the Michigan oil fields and in 1934 approximately 2,730,000 barrels were shipped, principally from the Saginaw River to Toledo. Around 100,000 barrels were refined at Cleveland. Since the installation of a cracking unit by the Naph-Sol Refining Co. at Muskegon, some Michigan gasoline is being shipped from this port.

The East Chicago petroleum shipping center is located on a canal extending inland about a mile and a half to the Forks, across which one of the accompanying photographs was taken, and on the branch extending westward from the Forks. All of the water terminals of the Chicago area except two city terminals of The Texas Co. are located in this vicinity. These two terminals are located one on the south branch of the Chicago River and the other on the north branch and facilitate city distribution.

In addition to The Texas Co. refinery at Lockport on the Chicago Sanitary and Ship Canal is the Globe Oil & Refining Co. at Lemont. Globe is the only small refining company in this area which can ship direct by



Courtesy Marine Review

The largest all-welded merchant vessel ever built in the United States and probably in the world, it was said of the Poughkeepsie-Socony when launched a year ago. Although of typical Socony Vacuum "canal" characteristics, with a 14 foot draft and a cargo capacity of 712,500 gallons, she has been operated on the Great Lakes this season as well

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marine transportation. Barges are used on the lakes instead of transferring to tankers as is The Texas Co. practice.

Receipts at Duluth recovered to 1920 volume by 1933 and went far above old records in 1934 when ever 2,000,000 barrels of gasoline were received there. Fuel oil also became an important receipt comprising 100,000 barrels in 1934 with a 100 per cent gain over the previous year. None was received by tanker in 1929. The Duluth area remains the largest consumer of lake-borne kerosine, receiving nearly 183,000 barrels in 1934.

Standard of Indiana having the only water terminal there, this volume is obviously all Standard's The Standard terminal is actually located in Superior and consists of about a dozen tanks ranging in capacity from 35,000 to 65,000 barrels.

The terminal serves a wide area, several hundred tank cars being operated out of the company's yard there and destined for points in the Dakotas, a good share of Minnesota, Wisconsin, and upper Michigan. A truck loading rack at the Superior terminal serves only the Superior trade, tank cars supplying even the bulk plant at Duluth cheaper than reloading into water craft.

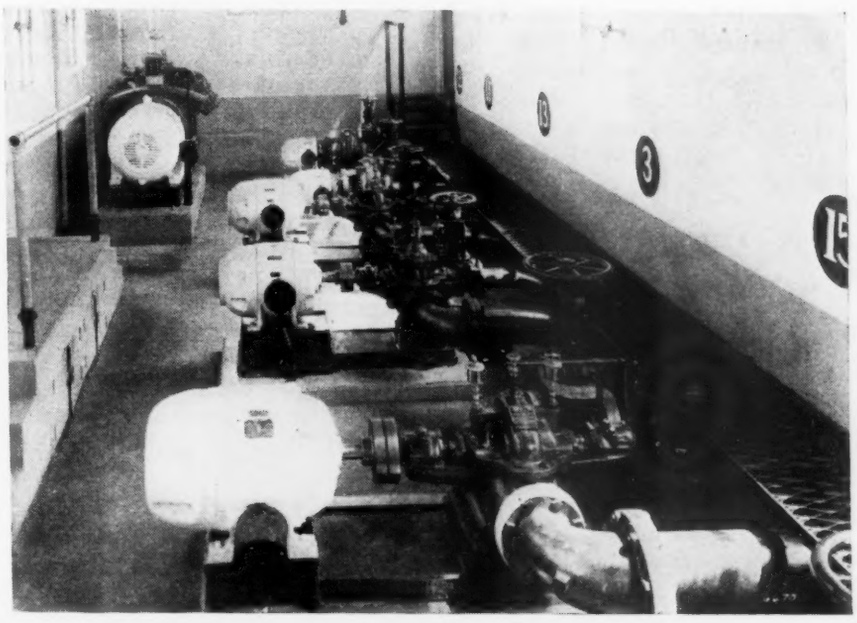
Duluth-Superior deserves special mention as being the first leader in consumption of lake-borne petroleum products. It now ranks second, Detroit's volume having reached a grand total of over 5,000,000 barrels in 1934, government figures show. This is a little less than half of volume shipped from Indiana Harbor whence the major portion originated. A total of 3,627,000 barrels of this was gasoline and most of the remainder fuel oil. Shipments from Detroit totaled 30,000 barrels of gasoline and fuel oil.

The Detroit area has the most and largest water terminals and bulk plants on the lakes. It also has the smallest. The docks of the larger plants are on the Rouge River. These include Standard with an estimated 50,000,000 gallon storage, The Texas Co., with 21,000,000 gallons, Gulf, Shell, Thiesen-Clemens, and Cities Service Co. The Sunny Service plant is closer to the business section. The Wiloil Corp., Pittsburgh, and Victor Oil Co. have a plant together a few miles south of the Rouge River and the Staebler Oil Co. plant is still farther south. These two are probably the smallest on the lakes.

The Texas Co. plant is a distributing center only and ships out entirely by tank car. Gulf, however, has about a dozen trucks which supply the local area in addition to its tank car shipments. The former is supplied by the tanker Maine which, although its capacity is 40,000, carries 30,000 barrels on account of the present depth of the Detroit River.

The development of water terminals in Michigan has seen the intrusion of independent marketers into the benefits of lower water rates in the past three to five years Sunny Service Oil Co., Detroit, built a terminal in 1931. Thiesen-Clemens, distributors of Mid-Continent Petroleum Corp. and Dixie products, promoted the building of terminals at St. Joseph, Detroit, and Port Huron (owned and operated by the Star Oil Co.). The Rennie Oil Co. has a terminal which it is enlarging at Traverse City.

The Dixie Terminals Oil Co. with officers from two members of Dixie Distributors, the Staebler Oil Co., Ann Arbor, and S T



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The pump house at the Carteret, N. J., terminal of the General American Tank Storage & Terminal Co.

& H Oil Co., Bad Axe, built a water terminal in 1933 on the outskirts of Detroit. The Wiloil and Victor terminal at Detroit operates with only an old tanker of perhaps 1,500,000 gallons capacity, tied up to shore as storage. They distribute unbranded gasoline bought on the open market at various places, principally New York Harbor, it is reported.

Recently, this terminal was required to build a shore loading tank as a fire prevention measure. There are now facilities for loading three tank cars and a truck loading rack accommodating two trucks. The tanker is the property of the Gotham Transportation Co., New York, and it is filled from barges used in transporting the gasoline.

Mid-Continent Petroleum Corp. gasoline is brought by tanker from East Chicago from the dock of the East Chicago Dock Terminal Co. An accompanying photograph shows the General Markham in the background being loaded at this dock. Tank cars carry this gasoline from the end of the Great Lakes gasoline pipeline to this dock.

Using this same dock is the Hughes Oil Co., an independent Chicago concern which has about 5,000,000 gallons storage, facilities for loading and unloading tanker, and trucks. Storage and loading facilities of the Hughes company may be leased by individual concerns.

Two other independent oil companies at Cleveland and Buffalo handle fuel oil exclusively. The Allied Oil Co. at Cleveland has 13,000,000 gallons storage supplied by its own tanker, the Crudoil, shipping chiefly from Chicago and Toledo. The Frontier Oil Co. at Buffalo uses 8,000,000 gallons of its storage. The company owns three barges which can be employed on the lakes or on the New York State Barge Canal and Hudson River to New York Harbor. Most of its supply is said to be transported on the Canal.

Table I

Oil Companies Having Terminal Facilities on the Great Lakes

City	Company
Superior, Wis.	Standard of Ind.
Green Bay	Standard of Ind.
Muskegon	Standard of Ind., Shell Pet. Corp., Socony-Vacuum.
St. Joseph	Thiesen-Clemens, Shell Pet. Corp.
Traverse City	Rennie Oil Co.
East Chicago	The Texas Co., Hughes Oil Co., East Chicago Dock Terminal Co., Mid-Continent Pet. Co., Standard of Ind., Shell Pet. Corp., Empire Oil Ref. Co., Wadhams Oil Co.
Port Huron	Star Oil Co.
Detroit	Standard Oil Co., Shell Pet. Corp., The Texas Co., Gulf Oil Co., Thiesen-Clemens, Cities Service Oil Co., Sunny Service Oil Co., Victor Oil Co., Wiloil Corp., Dixie Terminals Oil Co., Staebler Oil Co., Socony-Vacuum.
Bay City	Standard of Ind., Shell Pet. Corp., Pure Oil Co., Thiesen-Clemens, Cities Service Oil Co.
Toledo	Standard of Ohio, Gulf Oil Co., Sun Oil Co., Pure Oil Co., National Refining Co., Shell Pet. Corp
Cleveland	Standard of Ohio, Shell Pet. Corp., Allied Oil Co., Socony-Vacuum, Gulf Refg. Co., The Texas Co., Sun Oil Co., Pure Oil Co.
Buffalo	Standard of N. Y., Frontier Fuel Oil Corp., Richfield Oil Co., American Oil Co., Pure Oil Co., Pet. Wholesale Co., The Texas Co., Colonial Beacon Co., Shell Petroleum Co., Sun Oil Co.

New terminals have not been confined to independents by any means. The Texas Co., Gulf Oil Co., Cities Service Oil Co., and Socony-Vacuum Co. have acquired facilities at Detroit in the past two years. Socony-Vacuum built a new terminal at Muskegon this year which was described in the Sept. 25 issue of NATIONAL PETROLEUM NEWS.

In Cleveland the only wharfs of oil companies listed by the government publication, "The Port of Cleveland, Ohio" for 1931 were those of the Standard of Ohio and Shell Petroleum Corp. Others in Table I were built since that time. In the same year in Buffalo, only Frontier, Standard of New York, and a plant abandoned since, were listed. All the rest, built along the Niagara River between Buffalo and Tonawanda are of more recent construction. At Erie, Pa., plans have been laid for the building of two terminals. The Sun Oil Co. announced plans in May of this year but did not proceed with them. Gulf Refining Co. is expected to complete a terminal there before the close of the navigation season.

One of the more interesting features of the development at Buffalo is the new $50,000 pier in the Niagara River, said to be one of the finest for the accommodation of lake vessels or canal barges. Consisting of a platform extending out from shore and supported by clustered piling, there are 16 pipeline terminals at the dock, four terminating at each of four unloading points so that four boats can unload at one time if necessary. Several of these lines are dummies at present and provide for future requirements.

Four oil companies are using this dock, the Sun Oil Co. which supervised its construction, The Texas Co., Colonial Beacon Co., and the Shell Petroleum Corp. These plants are located adjacent to each other on the far side of the road which parallels

Fig. 1—Principal oil ports on the Great Lakes. Circles indicate volume of gasoline moving through each port. Squares indicate volume of crude. Arrows indicate direction of movement through the port

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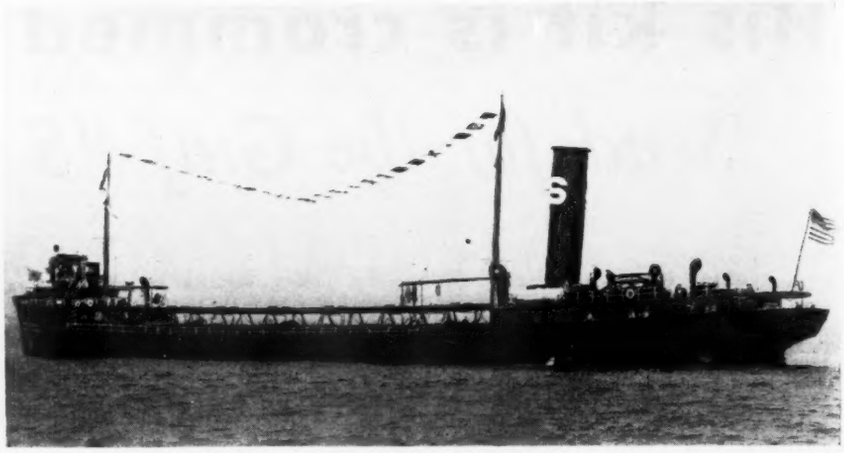
the river about a quarter of a mile away. The Texas Co. has the original plant of the Frontier Oil Co. which is now located two miles north of its old location.

Only one wharf for petroleum products is located on the Buffalo River. This is the property of the Standard of New York and is adjacent to its refinery. A relatively small volume of oil is loaded on tankers or barges here, company officials stated.

Buffalo, Cleveland, and Toledo both receive and ship petroleum products by water. Toledo's receipts were 37.5 per cent of its total volume, Cleveland's 57.8 per cent, and Buffalo's 71.6 per cent in 1934. None of these three cities received in 1934 the volume which Muskegon terminals handled, however. (See Table 2). All three cities have shown, by government records, their greatest increase in volume since 1929. Toledo had no receipts in 1929 and its shipments were less than a tenth of 1934 shipments; total 1934 volume was 30 per cent greater than 1933. Cleveland's water-borne commerce in petroleum products was negligible in 1929. Likewise receipts of gasoline at Buffalo were two and a half times as great in 1934 as in 1933. The larger portion of Buffalo's receipts came through the New York State Barge Canal from Atlantic Coast refineries or were transfered to barges from tankers coming up the Hudson River to Albany from the Gulf Coast of Texas or from the Pacific Coast.



Courtesy Marine Review

The newest tanker of the Standard of Indiana fleet, the Edward G. Seubert, is one of the largest on the lakes. It is 390 feet long and 53.3 feet wide, and carries over 2,000,000 gallons

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All oil terminals at Cleveland are located up the winding Cuyahoga River, from three to five miles from its mouth, with the exception of Allied Oil Co. which is on Old River, a branch of the Cuyahoga, a little over a half mile from the mouth of the Cuyahoga It takes four hours to navigate the river up to the Shell plant which is the nearest to the mouth. Enlargements of facilities are to be made at Cleveland by Shell and Socony-Vacuum, it is reported.

Toledo's oil company docks are on the Maumee River more conveniently located and more accessible to lake boats. The National Refining Co., although listed at Toledo, has not used its dock for two years, a company official stated. Shell is the only company known to receive shipments of refined products there.

There are also several smaller ports which are not shown on the accompanying map (Fig. 1) because of their relatively small receipts but which deserve attention. Sackets Harbor, at the east end of Lake Ontario, had receipts of 15,000 barrels of gasoline lakewise and 80,000 barrels of gasoline by the St. Lawrence River. Internal receipts also included 23,000 barrels of fuel oil and 11,000 barrels of kerosine. Clayton, N. Y., on the St. Lawrence River, had internal receipts of over 30,000 barrels of petroleum products. Ogdensburg, N. Y., also on the St. Lawrence, had lakewise receipts of 20,000 barrels of refined products and internal receipts totaling over 300,000 barrels. Around 11,000 barrels of refined petroleum products were shipped from Erie, Pa. Sandusky, Ohio, had receipts of 2500 barrels of gasoline and kerosine. The port of Sault Ste. Marie, Mich., received 14,000 barrels of fuel oil; Sheboygan, Wis., 700 barrels of oil; Charlevoix, Mich., 1000 barrels of gasoline and kerosine; Warroad Harbor, Minn., 500 barrels of gasoline, kerosine, and lubricants; Bayfield Harbor, Wis., 700 barrels of gasoline and kerosine; and Grand Marais Harbor, Minn., 300 barrels of gasoline and kerosine.

Of considerable significance

Table 2

Receipts and Shipments of Refined Petroleum Products on the Great Lakes in 1934

Port	Receipts Barrels	Shipments Barrels	Receipts Per Cent Gasoline	Shipments Per Cent Gasoline	Remarks
Superior, Wis.	2,350,000	.....	86.6	....	
Green Bay	765,000	.....	90.1	....	
Chicago	.....	1,161,500	....	83.3	Through traffic from Sanitary and Ship Canal.
Indiana Harbor	24,100	11,827,000	100.0	83.1	Lakewise traffic.
	1,148,000	.....	81.3	....	From Sanitary Canal.
St. Joseph	183,000	.....	100.0	....	
Muskegon	1,270,000	21,700	86.6	100.0	Also shipped 46,700 bbls. of crude.
Traverse City	76,100	.....	98.4	....	
Saginaw River	987,000	.....	92.4	....	Also shipped 1,161,500 bbls. of crude.
Port Huron: Included in Detroit totals, receipts only.					
Detroit	5,201,000	30,360	69.8	48.6	
Toledo	1,134,000	1,893,000	83.1	53.4	Also received crude 2,582,600 bbls.
Cleveland	1,067,500	812,000	75.8	92.4	Also received crude 110,000 bbls.
Buffalo	583,100	231,300	85.8	39.8	
Other waterways	North-bound	South-bound	North-bound	South-bound	
New York State Barge Canal through the Black Canal	77,100	1,575,300	16.7	76.9	
Welland Canal	2,692,000	2,304,000	51.5	68.7	Through traffic. Includes Canadian shipments.
St. Lawrence	269,500	4,826,900	9.1	39.0	Through traffic. Includes Canadian shipments.

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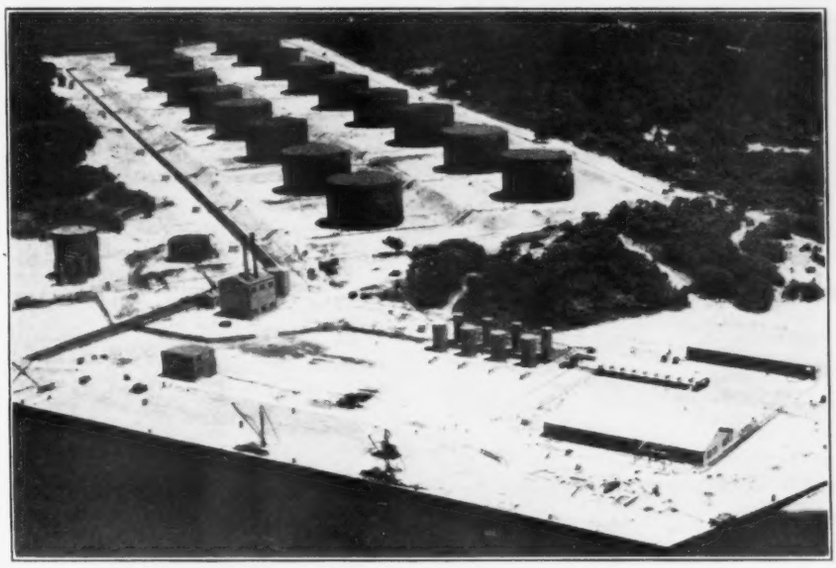

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to petroleum transportation is the Welland Canal. It carried into Lake Erie 2,300,000 barrels of petroleum products and into Lake Ontario 2,800,000 barrels in 1934, Canadian statistics show. An unknown volume of which was destined for Canadian ports. A portion of this volume may be accounted for from tankers and barges which can make better time by leaving the New York State Barge Canal at Oswego instead of proceeding on through to the Niagara River, Black Rock Canal, and out into Lake Erie at Buffalo.

Another portion passes through the St. Lawrence River. It is obvious from the St. Lawrence figures that considerable volume is destined for Lake Ontario ports. The figures include Canadian shipments. The volume of gasoline coming up the St. Lawrence was 1,879,400 barrels in 1934 and of petroleum and other oils around 2,900,000 barrels.

Although government records show that no petroleum products moved from the Mississippi River to Lake Michigan through Illinois Waterway and the Chicago Sanitary and Ship Canal in 1933 (probably there was none before that year), 155,000 barrels of gas oil went through in 1934. This movement calls attention to the fact that petroleum products can be brought by barge to the Great Lakes from the Gulf of Mexico or from St. Louis or other river ports and that this possibility is beginning to be realized.

The oldest tanker on the lakes in petroleum transportation service is the Beaumont Parks, built in 1912 for the Standard of Indiana, but the oldest boat is Barge "C" built in 1897 for Standard. Its appearance leads one to the conclusion that it was once a tanker moving under its own power. Since 1912, Standard acquired the William P. Cowan in 1918, the Robert W. Stewart in 1928, and the Edward G. Seubert in 1930.

Not all the tankers listed in Table 3 were put into lake service at the time of building. The Crudoil was brought up from the Gulf of Mexico in 1929 and the General Markham was put in lake service in 1933. Others came into lake service at other dates which could not be determined. The Maine, brought into the lakes in recent years, had to be cut in two and shortened to get in the locks of the Welland Canal. After a year or two of service, more carrying capacity was needed and the Maine was cut in two again and lengthened so that it no longer can get out of the lakes, it is said.

The first four tankers listed in Table 3 are all owned by companies associated with the Allied Oil Co. and are the only independently owned tankers on the lakes. The A. J. Patmore is at present in the service of the Sun Oil Co. Lakes Tankers Corp. is a Shell associate, and Great Lakes Transport Corp. is associated with Standard of Ohio and Pure Oil Co. and its tankers are serving these two companies and the Sun Oil Co. at Toledo principally. They carry crude from Bay City and fuel oil from Toledo to Detroit. An occasional trip is made between Cleveland and Lorain, Ohio, with fuel oil.

A round trip from Cleveland to Chicago requires seven days and a round trip from Cleveland to Toledo two days. The Chicago Detroit round trip takes about five days. The time depends upon many factors, however, including the size and number of loading lines and capacity of pumps. Common sizes were found to be six and eight inches diameter and a fewer number of 10-inch lines. Barge shipments from New York Harbor to Detroit require 10 days, it is said.

Table 3

Tankers of the Great Lakes—1934—American

(Data Courtesy of "Marine Review")

Company	Name of Vessel	Year Built	Capacity, Gals.	Power
Allied Oil Transport Co., Inc., Cleveland	Crudoil	1919	700,000	Steam, 1000 HP
Cleveland Tankers, Inc., Cleveland, O.	General Markham	1913	880,000	Steam, 1400 HP
Marine Tankers, Inc., Cleveland, O.	Comet	1913	870,000	Steam
Ohio Tankers, Inc. Cleveland	A. J. Patmore	1915	450,000	Diesel, 700 HP
Gulf Refining Co., New York	Harmony	1931	440,000	Diesel, 700 HP
	Regent	1934	714,000	Diesel, 850 HP
	Supreme	1931	440,000	Diesel, 700 HP
Lake Tankers Corp., New York	Martha E. Allen	1928	1,369,000	Diesel, 1500 HP
	Justine C. Allen	1930	420,000	Diesel, 600 HP
Standard Oil Co. of Ind., Whiting, Ind.	Beaumont Parks	1912	1,700,000	Steam, 1760 HP
	William P. Cowan	1918	2,500,000	Steam, 2000 HP
	Edward G. Seubert	1930	2,300,000	Steam, 2400 HP
	Robert W. Stewart	1928	2,000,000	Steam, 2100 HP
	Outagamie (tug)	1920	.....	Steam, 850 HP
	Barge "C"	1897	790,000	
The Texas Co., Chicago	Maine	1921	1,680,000	Steam, 1500 HP
	Harvey (tug)	1910	.....	Steam, 200 HP
	Latin American (tug)	1918	.....	Steam, 550 HP
	Texaco 155 (barge)	1919	370,000	
	Texaco 156 (barge)	1919	370,000	
	Texaco 158 (barge)	1919	370,000	
	Texaco 173 (barge)	1921	440,000	
Great Lakes Transp. Corp., Detroit	Mexoil	1918	700,000	Steam, 1000 HP
	Panoil	1920	700,000	Steam, 750 HP
	Fueloil	1919	700,000	Steam, 750 HP

Under Canadian Registry there are 19 oil tankers, all steamers, and 1 barge engaged in the oil trade on the Great Lakes.

The ships given in the above table only those whose "stamping grounds" are on the lakes. Outside of the navigation season some of these tankers and barges may go on salt water. On the other hand, other tankers and barges from the outside are frequent visitors on the lakes. For example, the Socony Poughkeepsie was photographed at the dock of Socony Vacuum's new plant at Muskegon, Mich., this year.

Airplane view of the Corpus Christi water terminal of the General American Tank Storage & Terminal Co.

90 Per Cent of Gulf Coast Refined Oil Products Move By Water

By Allen S. James
N. P. N. Staff Writer

APPROXIMATELY 90 per cent of the mammoth stream of gasoline, kerosine and other light petroleum products that pour through the look boxes of Texas and Louisiana Gulf coast refineries is transported by water for at least a part of its journey to consumer.

Some of the oil travels less than 30 miles. Some goes to far-flung foreign ports. In many instances, water-rail, or water-truck, and even water-rail-truck transportation is utilized.

The 10 per cent or less that does not encounter water in its travels is that portion moved from the refineries directly inland to adjacent consuming centers. The transportation for that oil is by rail or truck, or a combination of both.

This rail and truck movement is confined for the most part, through competitive conditions, to the south half of Texas and Louisiana. Texas is well dotted with refineries, and there are several sizeable ones in northwestern Louisiana so a Gulf coast refiner cannot go very far inland without encountering considerable competition from refiners that literally surround the area in which he might try to market his products.

Some 1934 figures reveal the extent of water transportation activity in the Gulf Coast district. In Texas, on the Port Arthur canal, crude oil shipments amounted to 16,592,532 barrels. Gasoline shipments exceeded this figure, totaling 20,276,084 barrels. Fuel oil shipments came next, with 14,514,220 barrels.

Reports for 1934 show that at the Houston ship canal over 35,000,000 barrels were shipped, with fuel oil and gasoline going well over 17,500,000 barrels. At many points along the Gulf coast there are impressively large figures representing receipts of crude oil and refined products by water. For instance, at Mobile, Ala., 696,300 barrels of crude oil were received by water in 1934, and over 1,623,375 barrels of gasoline. Fuel oil receipts amounted to 1,012,425 barrels.

At New Orleans, coastwise gasoline receipts for 1934 amounted to 3,151,144 barrels. Crude oil receipts at this port reached 7,168,004 barrels, and fuel oil receipts, 1,590,597 barrels.

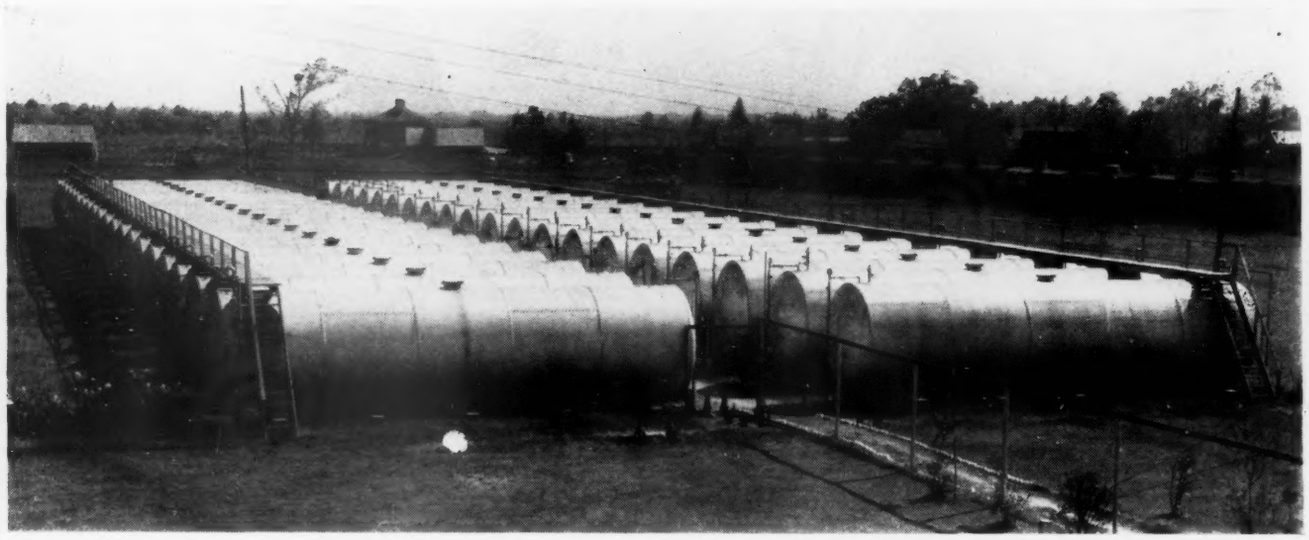
Gulf coast refineries shipped 5,715,000 barrels of gasoline to the east coast. This left a very considerable portion to be consumed in the south half of the southwest, the south-central, south and southeastern sections of the U. S. In reaching this consuming area a good share is transported at least part of the way by water.

Every community of any size along the Gulf coast has one or more water terminals, or is supplied by truck from terminals not far distant. In all of the larger consuming centers virtually all the refiners along the coast who have their own retail distribution, have installed water terminals.

Some of these terminals are relatively small, having storage capacity for some 1500 to 1800 barrels of gasoline. Others are large and have facilities for loading tank cars or trucks for movement farther inland.

Barges are used to transport most of the light oils to the terminals along the Texas Gulf coast, and to a lesser extent along the remainder of the Gulf coast line. Refiners who have their own marine equipment say they have found it uneconomical to use barges of less than 1500 barrels capacity.

All the larger refiners have their own marine equipment. Some of the smaller refiners contract with barge line operators for transportation of their oils, and in some instances rent tank storage from some of the



Pressure storage tanks at the water terminal of the General American Tank Storage & Terminal Co., at Goodhope, La.

larger companies, or from commercial terminals such as those operated by the General American Tank Storage & Terminal Co.

The General American company, with its five public terminals for the handling of bulk liquids, is the largest of its kind in America.

Two of the terminals are located within the New Orleans port limits, one being at Goodhope, La., 26 miles above the city, on the east bank of the Mississippi river, and the other being at Westwego, on the west bank of the river, almost opposite New Orleans.

Two terminals are located on the Texas Gulf coast, one at Corpus Christi, and the other, and newest, on the Houston Ship channel. The fifth terminal is at Carteret, in the New York harbor district.

Storage tank capacities range from 200 barrels up to 80,000 barrels. Facilities are such that every type of liquid can be handled without contamination. Pressure tanks are provided for the more volatile liquids.

The Goodhope terminal is called the world's largest public terminal. There are 14 separate pipelines over its docks, and six tank car loading racks. Liquids can be unloaded from ship directly into tank cars, or into storage tanks; or ships can be loaded directly from tank cars, or from storage. Barreling facilities are such that barrels, drums or tins may be filled directly from tank cars without the necessity of using tank storage

The company keeps available for lubricating oil tanks with capacities ranging from 200 up to 10,000 barrels, each tank equipped with heater coils. The light oils storage tanks range from 10,000 to 55,000 barrels, with water-top or insulated roofs. The crude oil tanks have capacities from 10,000 to 55,000 barrels.

There is a maximum of flexibility provided in the company's method of operation. Cargoes can be assembled, for example, in single carloads, or by the trainload. Or cargoes can be stored and moved out in small barge or tank car lots. The tank

The Goodhope terminal of the General American Tank Storage & Terminal Co., just above New Orleans, La.

ADVERTISING PAGES REMOVED

MORE BUTLER TRAILOW-TANKS

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GROWING apace with the rapid development of oil distribution from water terminals is the Butler Trailow-Tank. Those pictured here are all transporting from seaboard, lake or river terminals.

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Oil men everywhere are taking advantage of the savings in hauling costs afforded by the highest development in highway transport units—the Butler Trailow-Tank. Its designers, the most experienced, most capable staff of tank body engineers in the country, are at your disposal. Write or wire now for full information.

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One of the Humble Oil & Refining Company's barges at a Humble water terminal on the Hudson ship canal, Texas

storage can be leased by the year, month or even for a single shipment.

While material is in storage, the General American negotiable warehouse receipts provide acceptable collateral at banks.

Most of the barges used for off-shore movement of oils are from 5000 to 8000 barrels capacity. Particularly is this true of barges which are used to transport oils up the Mississippi and Ohio rivers. Smaller barges are used on the Tom Bigbee, Warrior and Alabama rivers in Alabama.

Tankers are used in some instances to take oils from the Texas coast plants to New Orleans and vicinity, where the cargo either is placed in terminals for trans-shipment up the Mississippi river, or a portion of the cargo unloaded and the remainder taken to terminals farther east along the coast.

The Republic Oil Refining Co., for example, has been moving oil from its Texas City plant by tanker to the General American's terminal at Goodhope, just above New Orleans, where transfer is made to barges which travel up the Mississippi. The oil is taken as far as Pittsburgh that way.

The Gulf Refining Co., Pure Oil Co., Magnolia Petroleum Co., The Texas Co., Shell Petroleum Corp., Sinclair Refining Co.,—all of them are extensive users of terminals and water transportation in the Gulf Coast area in getting their products to their retail markets.

The Pure Oil Co., has a terminal at Mobile, from which point it barges its oil almost as far north as Birmingham, to supply much of the territory around that city. Its terminal at Pensacola is used to supply its southern Alabama and Georgia trade. The Pure Oil Co., installed floating roofs on its storage tanks with the result evaporation losses were reduced considerably this past summer.

Other refiners for many years have been extremely alert to the possibilities of water transportation. The Standard Oil Co. of Louisiana and the Gulf Refining Co., are outstanding examples.

The Louisiana Oil Refining Co., a Cities Service unit, at Shreveport, has been active in water transportation. Louisiana Oil moves a considerable amount of oil by pipeline and rail to Port Neches and the Mississippi river, where it is shipped by barge or tanker to the company's markets in the south and southeast.

The companies which own their own marine equipment have been reluctant to reveal their water transportation costs, particularly as compared with rail costs to the same destinations.

The official of one of the larger companies testified a few years ago before a congressional committee, however, that his company was moving gasoline by water from the Texas coast to the vicinity of Pittsburgh for about half the rail cost from Philadelphia to Pittsburgh. Rail rates probably have been revised since then, but it gives an idea, nevertheless, of the economy of water transportation.

The refiners who do not have their own water transportation facilities but contract with barge lines are understood to be given rates based somewhat on the volume per month and the distance transported. It is difficult, therefore, to say with any degree of certainty just what is the average cost per barrel for transporting oil in that manner.

At times in the past some of the inland Texas and Louisiana refiners have obtained some of this domestic business handled by water transportation. That has been due mainly, however, to a distressed market situation at those inland refining centers. There have been persistent reports within the past few months, however, that some of the inland refiners, particularly in the East Texas and North Louisiana - Arkansas districts, have been studying the water transportation situation very carefully with a view to moving more of their output in that manner.

Flexibility of Water Transportation Utilized by East Coast Oil Marketers

AS FAR back as 1869, ten years after the drilling of the Drake well, petroleum was transported by water. A sailing vessel, outfitted with iron tanks and pumps, was the forerunner of the modern oil tanker.

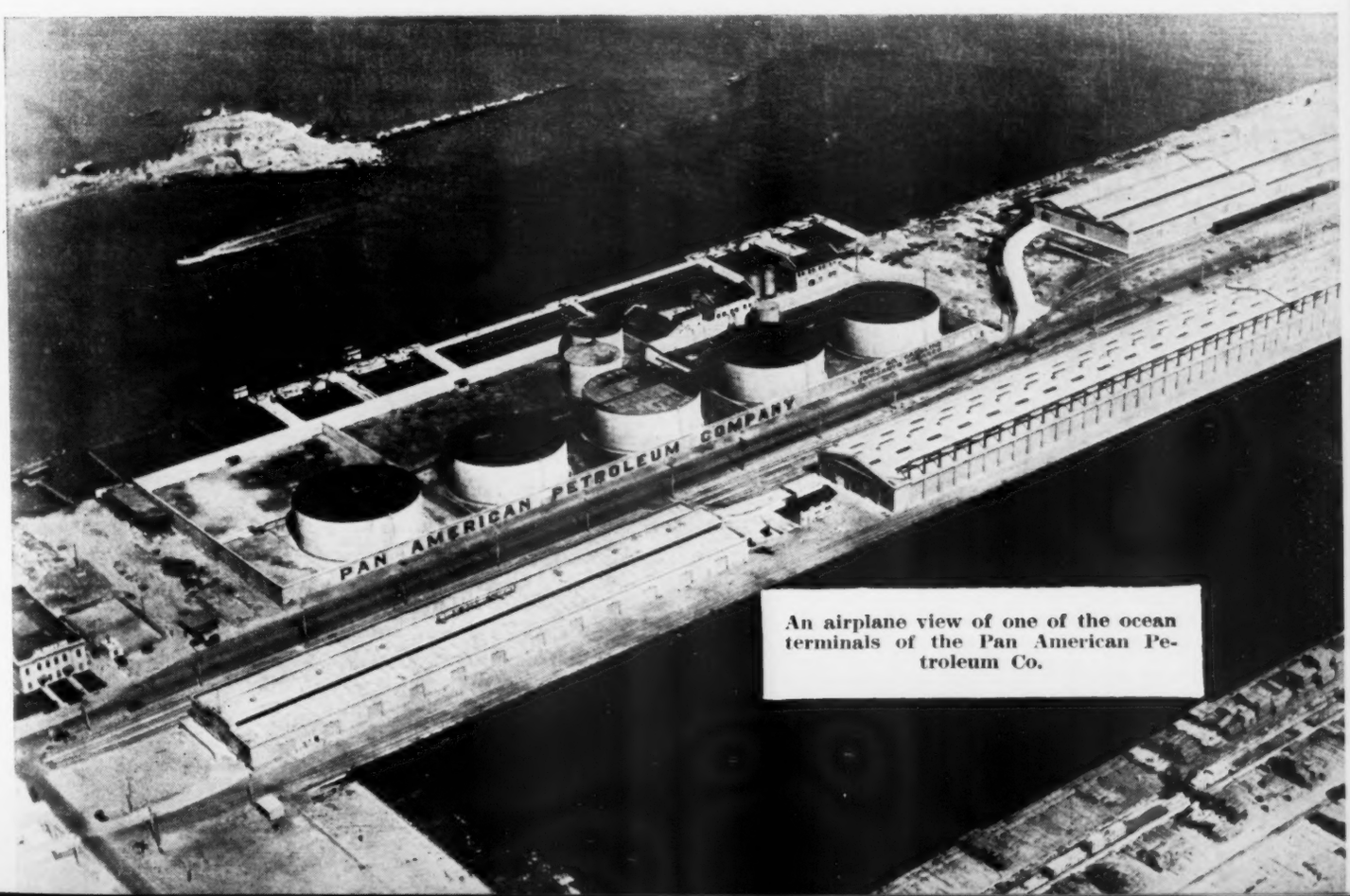
During the 20 years following this "sailing tanker" era, the business of transporting oil in iron ships built especially for the purpose became a normal practice.

Today there are about 380 ocean-going oil tankers owned by American oil companies, their shipping subsidiaries, and contract shipping companies. These tankers have a total deadweight tonnage of approximately 4,100,000 tons. According to recent statistics published by the Department of Commerce there are about 8,700,000 tons of American shipping in operation. This means that the ocean-going oil tanker fleet is substantially 50 per cent of the entire ocean-going American merchant marine.

The east coast, with its many rivers, bays, and harbors, providing accessibility by ocean tanker to so many concentrated markets, has been a great factor in the growth of water transportation of petroleum products. From Maine to Florida, ocean terminals dot the coast, representing mute but conclusive evidence of the economics to be found in water transportation. Many of these terminals are new and almost weekly there is word of plans for the erection of still another. The development of water terminal facilities along the east coast section, although well along with many major companies, is still in its infancy with some of the large companies.

Already a trend in this type of terminal operation by jobbers has appeared on the east coast, at Wilmington, N. C. A group of jobbers in this state, doing about 15 per cent of the total gasoline business, has organized under the name of Carolina Terminal, Inc. and obtained an ocean terminal to take advantage of the economies in water transportation. Deliveries to the member jobbers throughout the state will be made direct from this terminal.

This type of combined terminal effort on the part of jobbers has all the indications of a trend which is capable of saving the independent marketer considerable money. Co-operative terminals are also springing up along waterways in other sections of the country. Particularly for jobbers who do not require a terminal of their own, this plan permits them to buy, in a group with others, in large enough quantities that the saving is really impressive. One of



An airplane view of one of the ocean terminals of the Pan American Petroleum Co.

This ship is typical of the small coastwise oil tankers operating between Boston and Philadelphia. This particular vessel has a capacity of 5500 barrels

the important considerations in the economical operation of terminal facilities is the fact that it costs very little more to ship a 2,000,000-gallon cargo by water than it does 1,000,000 gallons.

Along the east coast, water transportation has become an important factor in setting prices. Practically all prices in this region are based on shipments by water. With this condition prevailing, it is imperative that every company avail itself of water transportation in some form along the line from the oil well to the distributor's bulk station.

The marine petroleum traffic along the east coast has a flexibility of operation which only this type of transportation can have. The very nature of the oil business demands this flexible movement. Many of the oil companies own their ships. Others charter ships owned by organizations in the shipping business. Of the 377 American ocean-going tankers, 307 are owned by oil companies engaged in refining, or their shipping subsidiaries, and 70 are owned by 23 nonoil companies. The oil company ships are referred to as private carriers, and the nonoil company ships as contract carriers.

In a business with peak loads such as the oil business enjoys, more ships are sometimes required than are owned by the oil company. On the other hand, most oil companies do not require the service of all their

Receipts of Petroleum Products by Water for Domestic Trade, 1928 and 1933 at Principal Points along Atlantic Coast (Figures in barrels)

	Crude Oil		Fuel, Gas Oil		Gasoline		Kerosine		Lubricants		Petroleum Products Unclassified	
	1928	1933	1928	1933	1928	1933	1928	1933	1928	1933	1928	1933
Boston, Mass. District:												
Penobscot River, Maine	.....	.....	271,600	617,700	.....	192,800	.....	35,900	.....	.....	270,100	356,200
Portland Harbor, Maine	.....	.....	491,500	1,056,700	.....	1,307,900	.....	448,900	.....	23,000	2,262,600	2,758,000
Boston, Mass.	8,260,400	12,433,500	2,780,000	734,600	533,400	756,200	.....	138,600	10,200	379,500	4,513,700	5,962,700
Providence, R. I., District:												
Fall River Harbor, Maine	2,099,400	.....	436,100	3,512,400	.....	2,717,900	.....	1,671,200	.....	.....	698,600	42,200
Providence Harbor, R. I.	.....	52,600	2,933,200	4,388,400	2,792,100	2,723,000	.....	663,000	.....	78,900	5,523,900	6,471,100
Connecticut River below Hartford, Conn.	.....	.....	245,600	1,111,000	.....	1,367,400	.....	627,400	.....	.....	1,511,700	1,303,500
New Haven Harb., Conn.	.....	.....	247,700	981,500	306,900	1,288,400	.....	603,200	.....	1,300	440,000	257,700
New York First District:												
Port of New York*	29,811,200	34,650,800	10,147,500	20,992,900	9,591,000	23,120,300	507,800	1,293,600	2,048,100	560,900	10,095,100	15,787,300
Hudson River, N. Y. Upper (a)	.....	357,800	780,300	1,681,600	3,470,000	4,955,800	143,500	484,400	83,400	48,200	532,900	1,312,500
Philadelphia, Pa., District:												
Delaware River, Philadelphia to the Sea	21,955,800	36,083,700	357,900	1,726,900	4,047,700	5,289,400	63,600	70,700	3,245,300	575,600	13,700	91,000
Schuylkill River, Pa.	14,923,800	27,116,700	2,385,600	2,591,300	1,282,000	1,975,900	398,100	158,300	679,200	408,600	141,700	5,500
Port of Greater Philadelphia, Pa.**	36,879,600	63,200,400	2,743,500	4,318,200	5,329,700	7,265,300	461,700	229,000	3,924,500	984,200	155,400	96,500
Baltimore, Md. District:												
Baltimore Harbors and Channels, Md.	6,859,100	6,492,600	1,373,600	7,520,300	2,910,600	8,870,600	314,600	706,100	8,000	33,400	37,000	605,300
Norfolk, Va., District:												
Norfolk Harbor, Va.	.....	54,200	1,175,700	476,600	1,876,000	2,982,400	252,300	249,300	.....	.....	306,100	103,500
Wilmington, N. C., District:												
Cape Fear & Northeast Cape Fear Rivers, N. C.	.....	.....	.....	67,000	1,796,000	3,083,600	336,300	381,400	100	2,400	.....	.....
Charleston, S. C. District:												
Charleston Harbor, S. C.	.....	109,100	1,965,200	619,700	4,239,800	3,240,000	.....	499,000	142,300	145,300	.....	.....
Savannah, Ga., District:												
Savannah Harbor, Ga.	.....	.....	767,500	852,500	2,715,000	3,083,900	365,300	329,600	68,600	49,400	.....	.....
Brunswick Harbor, Ga.	2,092,000	1,662,900	.....	.....	24,500	.....	.....	.....	32,200	.....	.....	.....
Jacksonville, Fla., District:												
St. John's River, Fla., Jacksonville to the Ocean	55,600	12,200	1,621,100	2,640,600	3,860,400	2,433,200	103,600	317,900	219,20	105,100	.....	14,000
Tampa Harbor, Fla.	152,500	.....	1,907,400	2,137,300	2,187,900	1,958,500	449,000	345,600	30,900	83,500	.....	.....

*This is a consolidated statement, and includes ports in the New York, Second District (a) Upbound River Traffic.
**Includes reports of "Delaware River Philadelphia, Pa., to the Sea" and "Schuylkill River, Pa.".

The S. S. Seaboard, the diesel powered 240,000 gallon tanker owned and operated by the Pennsylvania Petroleum Products Co. of Providence, R. I. The vessel is a rebuilt passenger boat, and is electrically welded from bow to stern

• • •

vessels at all times. Under these conditions there is often an interchange of carriers between companies, with one oil company chartering its carrier to another.

The contract carriers furnish a large part of the transportation requirements to marketers who do not have refineries and who purchase their supplies on the open market and distribute as wholesalers or retailers.

Situations frequently arise where oil companies sell to other companies cargoes in transit, so that a ship may begin a trip as a private carrier for an oil company's own supply and end up as a contract carrier. Tankers often start out for a particular port and are diverted to another port. Then too, ships start on trips with destinations unknown, subject to radio orders.

It is this flexibility of operation which permits tankers to serve the many ports along the east coast, and to feed ocean terminals with refined products, which are later transferred to barges and floated inland through bays, harbors, canals and inland waters. The oil industry will not dispute the fact that water transportation of its products offers the most flexible, serviceable, and cheapest means of transportation available.

Crude oil is gathered by pipeline or tank car and stored at loading ports in large tanks, from which it is pumped into tankers. The principal loading ports along the Gulf coast are Corpus Christi, Galveston, Texas City, Houston, Beaumont, Baton Rouge, and Port Arthur. This crude is transported along the Atlantic coast to Savannah, Brunswick, on Chesapeake Bay, Delaware river, New York harbor, Providence, and Boston. There it is pumped from the ships into storage at the refineries.

• • •

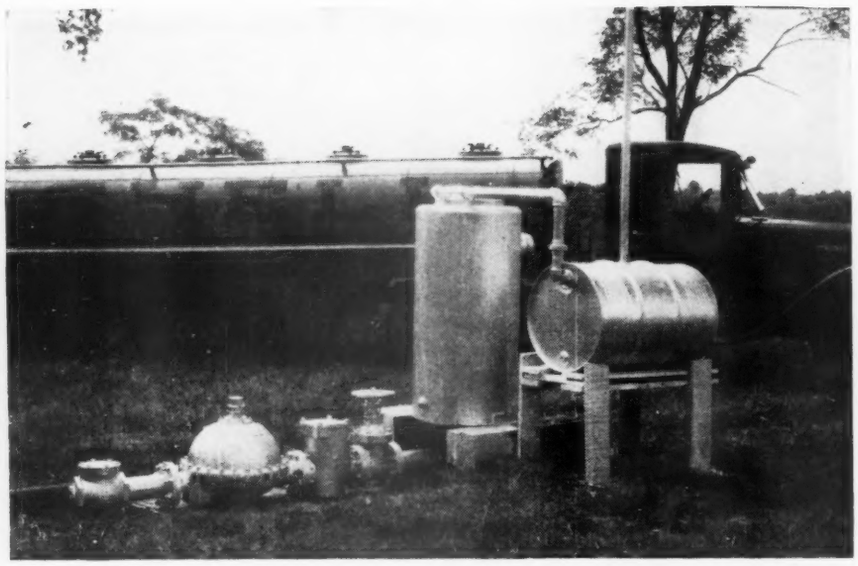
This pictorial map shows how the Gulf Refining Co. employs water transportation to serve 29 states. Thirty-seven ocean tankers and 47 barges serve 16 big ocean terminals and numerous smaller marine bulk terminals

The coastwise movement of refined petroleum products has also reached tremendous proportions. Ocean water terminals which dot the east coast line receive products from refineries along the eastern seaboard and the Gulf district, where they are stored for further distribution inland by barge through harbors, canals, and inland water points and to other inland points by tank car and tank truck.

Water transportation has now developed to a point where the marketer who wishes to benefit by this type of shipment and its resultant economies has at his command all the necessary distribution facilities.

There are companies that rent tankers and barges. There are storage warehouse terminals along the coast where the marketer may store his products pending further distribution inland by water or by rail or truck. In fact, it is quite common practice along the east coast for oil companies to rent out their carriers and vessels that are not in use at the time to any oil company in need of such facilities. A little investigation by the marketer will reveal there are many ways in which the flexibility of water transportation and its storage

(Continued on page 126)



Gasoline unloaded at the Ohio River terminal of the Three Rivers Oil Corp. at Paducah, Ky., passes through this 4-inch meter on its way to the storage tanks

Unloading Barge Through Meter Cuts Losses For Kentucky Marketer

PROBABLY no other branch of the oil industry offers the meter installation a chance to prove its value more than does the water terminal. Here large cargoes are loaded and unloaded. Serving as it does, as a supply base, the water terminal is the heart of a distributing system for an entire district.

At ocean terminals, great tankers dock to unload a million or more gallons at a time. Branching out from these terminals are barge lines, railroads, and truck routes. Each represents a distinct loading or unloading operation into which meters are finding their way in increasing numbers.

At inland water terminals, barges are unloaded, and trucks and tank cars are filled. Each operation of transferring the products from one place to another represents a point where losses may creep in.

At one of these terminals where the monthly gallonage averages about 500,000, a saving of 1 or 2 per cent in handling loss represents a very impressive amount. Meters that can cut down losses to that extent, and many are doing it, are able to pay their own way after only a few months operation. As the volume of a plant increases, the degree of accuracy of the pin-gauge method of measuring decreases, with the result that the stick has no place in the present-day water terminal if losses are to be considered as a factor of efficient operation.

An excellent example to illustrate the saving that meters can offer is the experience of the three Rivers Oil Corp., of Paducah, Kentucky. This company's terminal, situated on the Ohio River, has two large storage tanks, each with a capacity of 105,000 gallons, and seven horizontal tanks with a capacity of 15,000 gallons each.

All gasoline is brought by barge from St. Louis and distributed to three inland bulk plants by truck. The terminal was built in 1933, and at that time a barge was purchased which has been operating regularly during the navigation season.

For the first year and a half considerable trouble was experienced in the barge operation, due to an inability to accurately account for the gasoline coming into the terminal. At that time the storage tanks and the barge were both pin-gauged, with the result that on almost every load received there was a shortage of from 1000 to 3000 gallons on a barge load of approximately 185,000 gallons.

Recently a 4-inch meter was installed at this terminal to be used in measuring the gasoline that the barge pumped into the storage tanks. The results since that time have been gratifying. After allowing for temperature variation each barge has checked accurately through the meter. On one recent barge load the variation was only 146 gallons on a load of 181,000 gallons. On another occasion recently there was a variation of only 2 gallons on a barge load of 177,460 gallons.

In addition to this 4-inch meter for incoming products, 2-inch meters are placed at the loading racks to record all outgoing products. As a result, the problem of losses has been remedied, and at the close of each business day there is a complete accounting for every gallon of gasoline that moved from the plant that day.

The Three Rivers Oil Corp. hires a packet boat to push its barge between St. Louis and Paducah. A one way trip requires about 48 hours, and the barge makes from 12 to 15 trips per year.

The pipe from the company's dock to the large storage tanks is 4 inches in diameter. Gasoline is pumped from the large tanks to the smaller horizontal tanks, and then into the trucks at the loading rack. Two twin pumps and one single pump of the rotary type are used in the pumping operations. The twin units each have a capacity of 200 gallons per minute and are powered by 3-horsepower motors. The single pump unit has a 100 g.p.m. capacity with a 2 horsepower motor.

Provision is made at the dock for servicing river boats with fuel oil, kerosine, and gasoline. These products are metered through a 2-inch meter.

The company has 12 service stations and 75 dealers, all of whom receive their supply by truck. Two semi-trailer units haul between the water terminal at Paducah and the three bulk plants at Benton, Mayfield, and Murray.

800,000 BARRELS

Of Storage Available for

YOUR OCEAN TERMINAL

IN the PHILADELPHIA HARBOR, at Paulsboro, N. J., we have complete and modern facilities for the storage and handling of any petroleum or other liquid commodity in bulk—to and from Ocean Tank Ships—Barges—Tank Cars and Tank Trucks.

These facilities will provide you with economical distribution and favorable freight rates for *YOUR* products to the world's richest market.

We are organized to arrange for transportation, the financing of storage inventories, and to cooperate in the marketing of your product.

This company can solve your storage problem.

Write for complete information on the services and facilities we have to offer.

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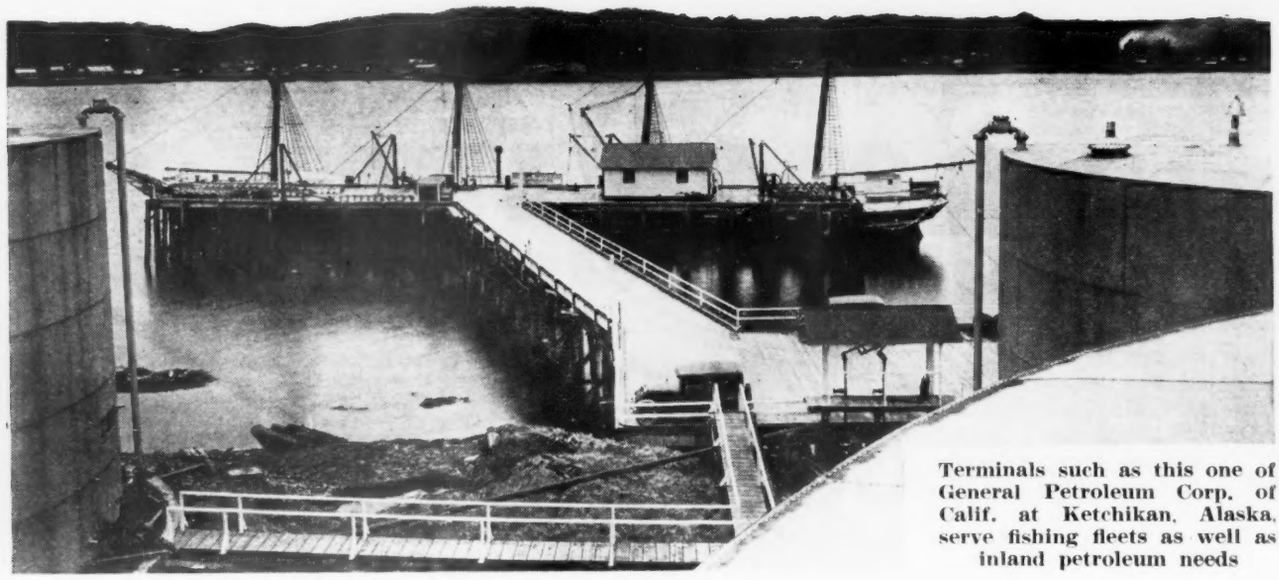


Terminals such as this one of General Petroleum Corp. of Calif. at Ketchikan, Alaska, serve fishing fleets as well as inland petroleum needs

Tankers Carry Nearly 200,000 Barrels Daily from Pacific Coast Ports

By Jack N. Westsmith
N. P. N. Staff Writer

MARINE terminal facilities of California oil companies, both major and independent, have enormously increased in the past twelve years. Although the importance of this form of transportation is not generally recognized; its growth today in many respects parallels the spectacular development that has taken place in highway transportation.

Marine terminals of all types and sizes dot the 2400 miles of coast line from Alaska on the north to the Mexican border on the south. Some of these, particularly at Los Angeles and San Francisco, are equipped to handle all forms of petroleum products in bulk, as well as in drums and cases. They have facilities to load giant tankers capable of carrying 140,000 barrels of gasoline to the Orient or to Europe; or they can service the small motor boat of 2000 barrels capacity that carries supplies to a limited area around the plant. Other terminals, such as those at Esteros Bay and Port San Luis, are equipped to handle only crude oil shipments. A majority have extensive docking facilities, whereas others, as at Elwood, load by submerged pipelines that carry the oil to tankers standing at some distance from the shore.

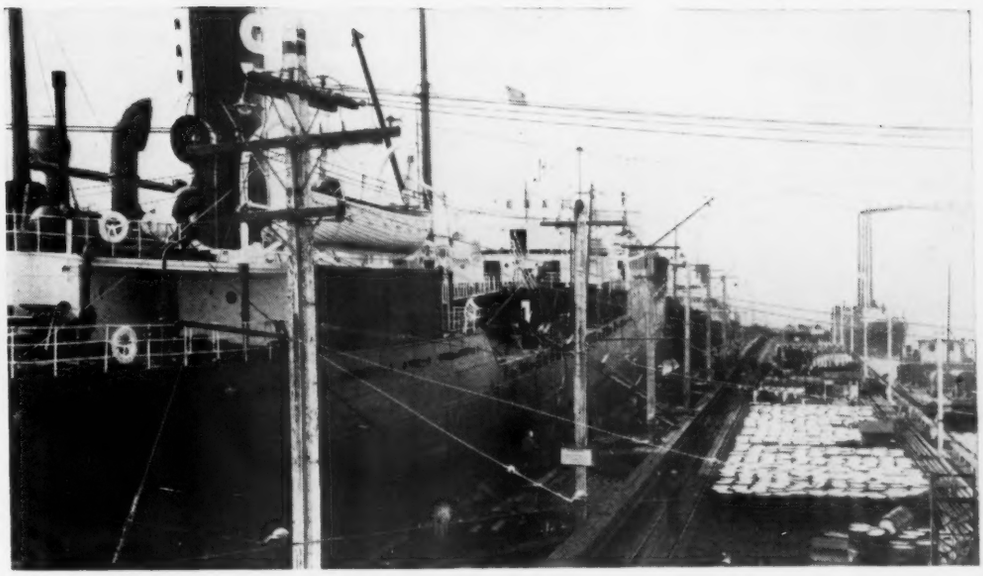
At its peak, in June 1930, the offshore tanker shipment of petroleum and its products from Pacific Coast territory totaled more than 277,401 barrels daily. Today, shipping facilities at these ports are greatly improved and capable of handling still larger quantities but, owing to changed business conditions, the volume has considerably decreased.

Total offshore tanker shipments from California for the month of August 1935, the last month for which figures are available, averaged 170,493 barrels daily. Pacific foreign shipments accounted for 118,979 barrels daily of this total, the major part of which was heavy crude and fuel oil. The notable feature of the month, however, was the decline in intercoastal shipments of gasoline which dropped from nearly 40,000 barrels daily in August 1934 to less than 5000 in August 1935.

Because of its proximity to the flush fields of southern California, Los Angeles harbor leads all Pacific Coast ports in volume of offshore shipments. From this port alone over 100,000,000 barrels of petroleum products, with a value nearly $200,000,000 are exported annually in normal years. In addition, 12,000,000 barrels of oil are furnished for bunkering purposes. Shipments are made to all parts of the Seven Seas, chiefly to the Orient, but also in considerable quantities to South America, Europe, and Africa.

Ten oil companies maintain bulk terminals at this harbor, with a combined loading capacity in excess of 100,000 barrels an hour.

Associated Oil Co. has three pipelines from its refinery at Watson to the harbor—one 8-inch and two 6-inch; and ten pipelines at the dock—four 4-inch, two 6-inch, one 8-inch, two 10-inch and one 12-inch. The company has storage capacity of 512,000 barrels at this terminal and can load three vessels simultaneously. By



Tank steamer of Standard Oil Co. of California loading at that company's marine terminal at Richmond, Calif.

means of two modern barges, it renders a service of 10,000 barrels capacity, capable of supplying bunker fuel oil to vessels at the rate of 2000 barrels per hour. It also has railroad car loading racks to accommodate 30 cars, and racks for loading tank trucks.

The marine terminal of the General Petroleum Corp. is equipped with five pipelines from its refineries at Vernon and Torrance—three 6-inch and two 8-inch; and eight lines at the dock—one 18-inch, four 12-inch, one 8-inch and two 6-inch —for loading vessels. It has a storage capacity at this point of 1,263,000 barrels and can load three boats simultaneously at a rate of 12,000 barrels per hour each, with dock space for one additional vessel.

The company maintains a small barge for bunker deliveries and is connected by pipeline with the municipal pipeline on Terminal Island. A bunkering plant, with a storage capacity of 80,000 barrels and connected with the loading berths, is also maintained by the company. Deliveries of bunker oil can be made to two vessels simultaneously at a rate of 500 to 2500 barrels per hour.

Bulk oil terminal and bunkering facilities are operated by Hancock Oil Co. on Terminal Island in the East Basin Channel. The plant is served by pipelines from the refinery, adjacent to the Signal Hill oil field, where the company has a net work of gathering lines. The terminal has storage capacity of 275,000 barrels with pumping capacity for gasoline of 14,000 barrels per hour and for black oils at rate of 10,000 per hour. Provision is made for delivery of bunker oil by barge.

Harbor plant of the Richfield Oil Co. is located on the Main Channel. It is served by four pipelines from its refinery at Watson—one 6-inch line and three 8-inch lines—and has storage tanks at the terminal for 440,000 barrels of oil. It can dock and load two vessels simultaneously, and for bunkering service maintains two modern steel barges of 7000 capacity each, capable of delivering 2500 barrels of oil per hour. The company also has small craft loading facilities at an adjoining berth for servicing large size pleasure yachts.

Shell Oil Co.'s harbor plant is connected with its Wilmington refinery by four lines—one 8-inch and three 10-inch—and has storage tanks for 300,000 barrels of petroleum products. It has four pipelines—two 8-inch and two 12-inch—for loading purposes. Three vessels can be loaded at one time. The company has three barges for supplying bunker oil to vessels. It also has pipeline connections to the municipal pipelines for bunkering.

Standard Oil Co. of California occupies two wharves near the Main Turning Basin. These wharves have facilities for loading five vessels simultaneously and are served by three 4-inch, four 6-inch, three 8-inch, three 10-inch, and five 12-inch lines. This marine terminal has a storage capacity of 832,000 barrels, and, in addition, a tank farm of 615,000 barrels capacity, located approximately two miles distant, is used by the company in connection with the terminal. The plant is equipped with 8-inch connections and tankage to handle ballast. Several barges are kept in local bunkering service.

Two berths are occupied by Sunset Oil Co., which has two pipelines at the dock, one 6-inch and one 12-inch, permitting the loading of two vessels simultaneously. Storage for 190,000 barrels is connected by one 6-inch and one 8-inch line to the company's inland tank farm of 670,000 barrels capacity, located 5 miles away. A barge of 8000 barrels capacity is maintained for delivery of bunker oil. In addition, an 8-inch submarine line, serving the berth, permits delivery of petroleum products direct to vessels.

The Texas Co. has four pipelines — two 6-inch, one 8-inch and one 10-inch — connecting its marine terminal with its refinery. It has seven pipelines at the dock — one 6-inch, one 8-inch, two 10-inch and three 12-inch — for loading vessels. The plant has total storage capacity of 490,000 barrels and can load two vessels simultaneously. Two steel barges are maintained for bunkering service. The company also has one 6-inch line and two 4-inch lines for refined oils connecting its marine oil loading station with

San Pedro marine facilities of General Petroleum Corp. of Calif. Photo Copyright by Spence, Los Angeles

its case and package plant on Terminal Island, across the channel from its other station.

Warehouse storage capacity for 300,000 cases is provided. Three conveyors connect the warehouses with the wharf, enabling boats to load at a rate of 4000 cases per hour. In addition to its warehouse facilities, the company has a completely equipped casing plant at the harbor, capable of handling 13,000 cases and 2000 drums per day. A complete compounding plant for various grades of lubricating oils is provided, with tankage capable of handling 100,000 barrels of lubricating oil products.

Union Oil Co.'s terminal is connected with its refinery at Wilmington by five lines — 12-inch, 10-inch, 8-inch, 6-inch and 4-inch — and one 10-inch line from the field. Its plant on the main turning basin is capable of loading two vessels at once. Pipeline facilities are maintained for bunker deliveries to vessels and leased pipelines for fuel oil are provided. The company has storage facilities at the waterfront with a capacity of 340,000 barrels for handling crude and fuel oil, while refined oils are loaded direct from the refinery. For barge service, three vessels are available with a total capacity of 16,000 barrels.

• • •

The marine terminal of the Western Oil & Refining Co. is located in the West Basin. As the loading berth is separated from the refinery only by a public highway, refinery storage capacity of 800,000 barrels is available for the loading of vessels, and all the manufactured products of the company are handled direct to the dock from refinery tanks through one 12-inch, one 10-inch and two 6-inch pipes. The company also operates a modern steel bunkering barge, of 8200 barrels capacity and capable of discharging 3500 barrels per hour.

In addition to its facilities at Los Angeles harbor, Standard Oil Co. of California has extensive marine terminals at Richmond, in the San Francisco Bay area, as well as at Elwood, Estero and El Segundo. Much of the crude petroleum and natural gasoline brought by water to the Richmond manufacturing plant comes from Estero Bay, to which point they are transported by pipeline from Kettleman Hills. The water-craft that carry cargoes from Richmond include tankers that are steam driven or powered with internal combustion engines, a paddle river steamer, and barges that have no driving power of their own. The ultimate delivery point of these cargoes may be in a foreign country or a depot in the San Francisco Bay area immediately adjacent.

At Estero Bay and at El Segundo vessels are loaded by means of submarine lines extending from the shore line into deep water. At Estero, the line is 16 inches in diameter and 3000 feet long. At El Segundo, two submarine lines, 3200 feet long, are connected to a wharf that itself extends 2200 feet from the shore line.

In addition to its facilities at Los Angeles harbor, Associated Oil Co. has marine terminals at Ventura, Gaviota, Monterey, and Port Costa.

Many New Safety Features In Hudson River Terminal

By John W. Thompson
N. P. N. Staff Writer

The R. D. Leonard, an ocean tanker owned by the Atlantic Refining Co., unloading at the company's marine terminal at Rensselaer, N. Y., on the Hudson river

ONE of the developments which have come as a result of the tremendous growth of water transportation in the petroleum industry has been the transshipping, or transfer terminal. Ocean tankers unload their cargo at these terminals where they are stored until ready to be loaded into barges for further shipment into canals, rivers, or other waterways closed to ocean-going vessels.

One of the latest and most modern terminals of this type is the Atlantic Refining Co., Inc., plant at Rensselaer, N. Y. Ocean tankers come up the Hudson river to the terminal dock, which is across the river from Albany. The products are unloaded into storage tanks, and from there, as requirements demand, the products are loaded into barges for shipment to the company's water terminals at Syracuse and Rochester, on the New York State barge canal.

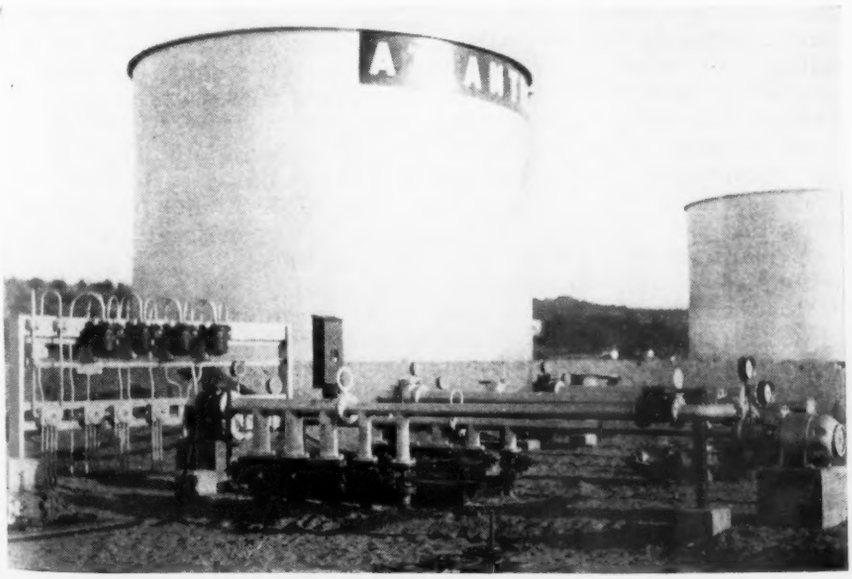
This terminal also serves as a distributing base for the local territory. The company has two 4500-gallon six wheel trucks with trailer units operating out of the terminal serving dealers within a 75 mile radius. Tank car shipments are also made from this point into the northeast section and to the Albany distributor.

The plant has 8 storage tanks with a total capacity of 6,340,000 gallons. Five of these tanks are for gasoline storage and have pontoon type floating roofs. There are three 1,000,000-gallon tanks, three 880,000-gallon, one 450,000 gallon, and one 250,000-gallon tanks. The tanks are brightly painted with aluminum paint and are lined up in two rows of four each.

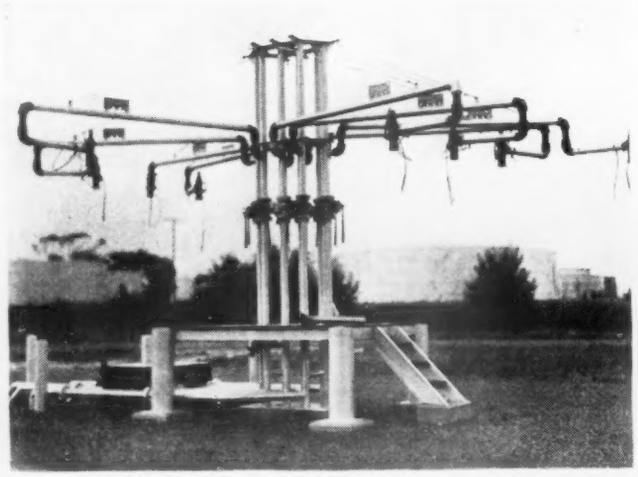
From the dock to the tanks the products pass through 8-inch lines, being pumped from the ship at the rate of about 1900 barrels per hour.

The lines running from the tanks to the loading racks are 6 inches in diameter, with 4-inch risers at the racks. All pipe joints are welded. The pumps, used for pumping from the various tanks to the loading racks, are set out in the open with no shelter from the weather. This method of locating the pumps is said to have originated with Atlantic and meeting with increasing favor in the newer plants for safety reasons.

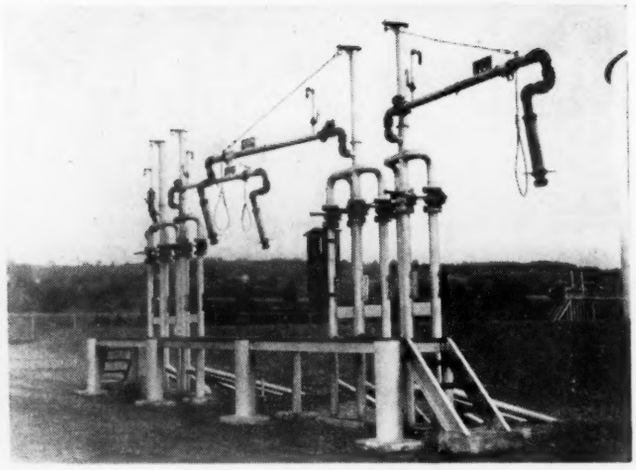
One of the pumps has a 770-gallon-per-minute capacity and is driven by a 15-horsepower motor. There are two pumps of 500-gallon-per-minute capacity, driven by 7½-horsepower motors, and one 425-gallon-per-



Pumps and motors are out in the open at the marine terminal of the Atlantic Refining Co. at Rensselaer, N. Y., thus avoiding any danger of explosion due to sparks from the motors. Switches, seen at the left, are immersed in oil as an additional safety precaution



Retail trucks are loaded at this rack



Two spot loading rack for transport trucks

minute pump using a 5-horsepower motor. All of the motors are weatherproof and explosion proof. All switches are immersed in oil and are therefore explosion proof.

The novel pipe manifold arrangement permits great flexibility in the pumping operation. Lines from the pumps to the tanks can be shut off so that the ship can pump from the dock direct to the loading racks if desired. It is also possible to pump from the tanks to the loading racks at the same time the tanks are being filled from the boat. In addition to these operations it is possible to pump from the tanks to the boat and from one tank to another.

Lubricated cocks with lever arms for opening and closing are set in the manifold lines to facilitate speedy operation and to show the operator at a glance which lines are open.

The plant has three separate loading racks, two of which are for trucks and one for tank cars. They are constructed entirely of metal and are 100 per cent welded construction. One of the truck racks is for transport service, and the other is for retail trucks. The transport truck rack has two spots for loading, with six products available through two fill pipes at each spot.

The retail truck rack is circular in shape and can be approached from any angle by the truck, depending on the product wanted. It has eight fill pipes radiating out in fan shape from the center of the rack. The tank car loading rack can load two cars at the same time. There is an electric car puller at the railroad siding which is used to spot the cars when there are more than two to be filled. It will pull the weight equivalent of two loaded tank cars.

Each storage tank at the plant is equipped with an anti-fire anti-freeze outlet valve located at the pipe connection at the base of the tank. These valves operate inside the tank. In the stem of each valve is a special composition metal core, which in case of fire or excessive heat will melt, causing a spring to release which automatically closes the valve.

Atlantic officials state that this is the only valve of this type ever developed and the only valve that shuts off in case of fire that cannot be tampered with.

Another interesting safety feature at this plant is a siren signal system which can be operated at three strategic locations—at the docks, at the pumps, and from the tops of the floating roof tanks. With the dock about 1000 feet from the pumps and the tanks, this signal system is of considerable help. If the boat is pumping into the tanks the operation can be started or stopped simply by certain blasts of the siren. The same is true for loading the boat from the tanks. Sirens are located at the dock and at the tanks. One blast means to slow down pumping; two blasts — stop pumping; three blasts — start pumping slowly; four blasts—resume full speed pumping.

At the dock are four 20,000-gallon horizontal tanks and one low vertical tank. Two of these horizontal tanks are for bunker oil for the barges. The tanks are filled direct from the tanker at the dock. The low vertical tank is used as a separator into which barges coming down the river pump their ballast. The oil is separated out from this water and pumped into the other two horizontal tanks. This waste oil is then pumped into the tankers and taken back to the company's refinery at Philadelphia on the empty trip.

The entire plant, including the dock, is fully equipped with flood lights so that operations can go on uninterrupted, regardless of the time of day or night.

Canal to Link Galveston And Corpus Christi

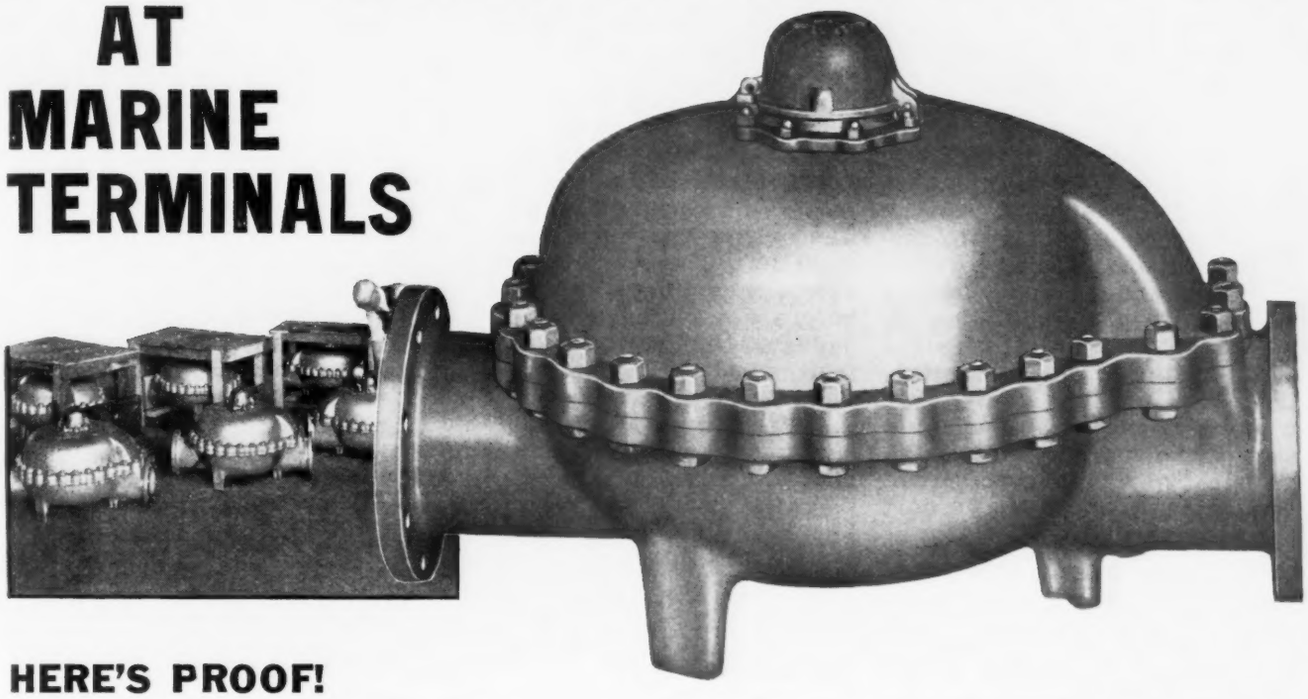
HOUSTON, Texas, Oct. 10.—Completion of the Intracoastal Canal from Galveston to Corpus Christi, Texas, within the next two years is predicted as the result of a recent decision of the Texas Highway Department, according to Roy Miller, active vice-president of the Intracoastal Canal Association.

The highway department has decided to construct and maintain the necessary bridges over the canal.

A considerable amount of dredging already has been done, it was said, and by the time the bridges are completed the canal is expected to be completed sufficiently to permit its opening.

This will provide an inland waterway from Corpus Christi to the Mississippi river.

METERS *FOR THE* .... BIG LINES .... AT MARINE TERMINALS



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Your answer to all these questions is a positive YES if marine terminal and bulk station lines are Niagara metered. These precision, single-piston displacement meters are the logical choice for dependable measurement on all large lines or under severe service conditions. Marine terminals need meters of sizes up to 6-inch with big capacity, fine accuracy, rugged construction and freedom from water corrosion. You can obtain all these in one meter, the Niagara, and by it obtain real efficiency in oil or gasoline measurement. Among the very few brands of displacement meters made in 6-inch size, the construction of the Niagara Meter makes it stand out as the *practical* meter. Read the list of features in the next column.

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Oil Companies Must Examine Many Factors Before Building Water Terminals

By M. G. Van Voorhis
N. P. N. Staff Writer

IS IT possible for the independent distributor to take advantage of savings resulting from water transportation on the Great Lakes and inland waterways?

That it can be done is shown by the fact that a few are doing it. However, warnings are issued by those of experience that it would likely prove disastrous to neglect consideration of any one of the many factors which govern the building or operation of a water terminal or bulk plant. This is particularly true on the Great Lakes where navigation is open only part of the year. Normally the principal navigable streams are open for all but a very short period during the year.

Large troughput and large storage facilities are the chief essentials, it is agreed. The term large is used in contrast to plants supplied by more regularly scheduled tank cars, where incoming shipments can be regulated more closely to outgoing gallonage.

The smallest river barge holds about 10 carloads and many carry over 20 carloads for which storage must be available unless arrangements can be made to co-operate with some other distributor. Barges for deeper water may carry 50 or 60 carloads and typical lake tankers carry from 40 to 200 carloads.

Since lake tankers require more time to stop for discharging cargo, both on account of their size in maneuvering and the distance of the terminal in most cases from the normal shipping routes, it is only an unusual circumstance which makes is practical to split a cargo. Even partial discharge of the river barge is looked upon with doubt as to practicability, however.

An exception to this rule exists at Port Huron, Mich. The ship channel of the Detroit River being too shallow to allow a few of the larger tankers to carry full cargos through, the General Markham can discharge from 200,000 to 400,000 gallons at the Star Oil Co. plant there before proceeding down to the Thiessen-Clemens plant at Detroit. The two plants are supplied from the same source at the present time. Although this is a frequent occurrence at this plant, a storage capacity in the neighborhood of 1,700,000 gallons permits an occasional discharge of a full tanker load.

THE particular conditions met at each locality make it impossible to prescribe rules to fit all individual conditions. It will be the object of this article merely to point out some of the things which operators have found to be worthy of thorough investigation. It should be recognized that a standardized bulk storage plant with a dock is not always essential to the reception of water-borne gasoline. Cases can be pointed out where neither are used, particularly on inland waterways. The Star Oil Co. at Port Huron, owned by and under the management of J. F. Wilson, president of the Michigan Petroleum Association, is typically independent and its capacity is perhaps as small as advisable to accommodate tanker shipments.

Although not actually on the lake, it has probably more advantages in being close to all the inter-lake traffic. A sufficient throughput is assured by 60 stations of its own, an additional 60 dealers which it supplies, as well as several jobber bulk plants within a radius of 60 to 70 miles.

Although at present under contract for the distribution of a branded gasoline Mr. Wilson has investigated other sources of supply and is prepared to go into the open market and buy unbranded gasoline on a quality basis. Such gasoline has been available for years in New York Harbor and on the Gulf coast of Texas from whence shipments may be made all the way by barge and/or tanker. Chicago also has sources of supply, not to mention the Michigan refiners. Mr. Wilson has had under consideration the purchase of a self-propelled barge to transport his purchases to his terminal, although plenty of tank ships are available for lease at the present time. With these possibilities open he feels assured of ample sources of supply of gasoline.

Once being assured that gasoline is available from a number of sources and that transportation means will be available, the next consideration is a marketing area in which a sufficient number of outlets is available to dispose of the necessary volume.

Competitive conditions should never be overlooked but even the proximity of refining centers has not prevented two or three groups at Pittsburgh from barging gasoline from as far as Good Hope, La. In Pittsburgh are the refineries of Gulf and Atlantic, and nearby the gasoline pipelines of Standard and Sun, both on the Ohio River. Atlantic has just announced a new gasoline pipeline from the east and future discontinuance of refining operations at Pittsburgh.

The cost of shipments, accountable for the increased volume of water transportation, is a matter of barter if common

(*Continued on page* 122)

Large Increase in 1935 in the Movement Of Oil Products on the Mississippi

ALONG the Mississippi river from the Gulf to Minneapolis is definite proof that water transportation of petroleum products on that stream has increased even within the current year.

Particularly is this noticeable on that stretch of the river between Cairo, Ill. and Minneapolis. A definite shortage of tank barges exists in the St. Louis-Wood River, Ill. refining district.

Barges carrying 7000 to 8000 barrels of light oils for the first time have been towed to Minneapolis from the Wood River district.

Two large distributors in Nashville, Tenn. and vicinity are receiving light oils by barge from the Wood River district, the Mississippi, Ohio and Cumberland rivers being used before the oil reaches its destination.

An independent distributor of a Wood River refiner's products obtains his requirements by barge at his own terminal at Osceola, Ark., and from that point distributes by truck in the northeastern portion of Arkansas and as far south as West Memphis, Ark.

Barge line officials report more numerous calls for tank barges, both from refiners and distributors.

A new and thoroughly modern terminal has been constructed this year at Vicksburg, Miss. by the Standard Oil Co. of Kentucky in Kentucky.

An independent refiner in the Louisiana - Arkansas district, according to reports encountered at several points along the river, has investigated the possibilities of a pipeline from his refinery to the Ouachita River, to permit barging gasoline down that stream to the Mississippi. Once on that river he can reach by two routes the area where his products have widest distribution. One is up the Mississippi into the Ohio and its tributaries; the other downstream to the Gulf, then eastward to such navigable streams as the Tom Bigbee, Warrior and Alabama rivers.

There is unanimity among barge line officials, oil company executives and statisticians for the U. S. Army Engineering Corps at St. Louis that there has been such an outstanding increase in traffic of petroleum products on the Mississippi since the first of the year that the government's 1934 figures can scarcely be used as a criterion of what the 1935 figures will total.

The larger oil companies have used the Mississippi and some of its tributaries for years in moving their products to market. The Standard Oil Co. of Louisiana, with its refinery at Baton Rouge, La., reaches the vast majority of its retail markets by way of the Mississippi, either going upstream or downstream and around the Gulf coast. The company also supplies the major portion of the requirements of the Kentucky Standard in its south and southeastern marketing area. Most of those requirements are carried at least a portion of the way by water.

From the Texas Gulf coast considerable oil is moved by Gulf Refining Co. up the Mississippi system to various distributing centers. The Republic Oil Refining Co. moves gasoline as far as Pittsburgh.

In the New Orleans refining district Chalmette Petroleum Corp. has been moving barge lots of gasoline and other oils to Cincinnati and Pittsburgh. Pan American Petroleum Corp., subsidiary of the Standard Oil Co. of Indiana, supplies by water some of its own marketing centers, as well as those of its parent company in the southeast. Shell Petroleum Corp., from its Norco, La. plant avails itself of the river facilities in the New Orleans area and at many points along the Gulf coast.

Up in the Wood River refining district, Shell has been using river transportation more extensively. It is Shell which

Oil Traffic on the Mississippi River for 1934*

Downbound Shipments — Districts						Upbound Shipments — Districts					
Wisc. River to Ill. River	Ill. River Mouth to Cairo (3)	Cairo to Memphis (2)	Memphis to Vicksburg	Vicksburg to New Orleans (1)		New Orleans (1) to Vicksburg	Vicksburg to Memphis	Memphis (2) to Cairo	Cairo (3) to Ill. Riv. Mouth	Ill. River to Wisc. River	Wisc. Riv. to Minneapolis
837	665,908	170,187	2,951	6,945,577	Gasoline	5,178,660	4,075,710	1,763,014	4,134	1,825	14
188	4,300	3,925	.....	3,946,114	Kerosine	701,183	567,186	237,662	252	188	.....
1,210	168,533	50,257	172,098	11,767,240	Fuel-Gas Oil	773,950	237,355	186,229	198,172	10,553	.....
1,287	16,860	39,620	33,044	139,337	Lube Oil	21,010	32,780	32,522	2,761	1,248	1,655
.....	.....	.....	2,134,181	6,617,046	Crude	9,325,312	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	Road Oil	19,151	19,151	19,151	19,151	.....	.....
.....	30,682	31,834	32,220	176,853	Asphalt	23,674	2,934	656	656	335	335
.....	.....	.....	.....	1,341,368	Bunker Oil	29,138	.....	.....	.....	.....	.....
5	.....	.....	.....	3,584	Coke	11,074	11,074	11,074	41,034	41,034	41,034
.....	.....	.....	.....	1,469,000	Wax Dist.	106,150	.....	.....	.....	.....	.....
.....	980	.....	.....	43,344	Other Products	.....	.....	.....	889	343	259
.....	.....	108,000	90,000	.....	Grease	.....	.....	.....	.....	.....	.....
.....	.....	86,000	86,000	65,980,000	Wax	.....	.....	.....	.....	.....	.....

(1) Includes refining district at Baton Rouge, La.
(2) The Ohio river joins the Mississippi at Cairo.
(3) Includes the St. Louis-Wood River, Ill., refining district.
*Figures in barrels except for coke (tons) and wax (pounds).

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HARTOL, with its numerous strategically located water terminals and allied distribution system, has absolute control over shipments, even when handicapped by abnormal weather conditions. Such control over delivery means definite security for our customers.

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has been moving most of the gasoline into Minneapolis this year by barge, unloading the gasoline directly from the barges into tank cars for distribution in that area. It is Shell's distributors at Nashville, as well as at Osceola, Ark., who are barging their gasoline at present.

The Standard Oil Co. of Indiana, it is reported, has not been active in barge movement from its Wood River plant upstream, but apparently has been moving some oil downstream and into the Ohio and its tributaries. A Nashville, Tenn. paper Sept. 26 carried a picture showing four barges which had just arrived at that city with gasoline for the Pan American, the gasoline having been loaded at Wood River.

Phillips Petroleum Co. has been barging some oils from its East St. Louis gasoline pipeline terminal, most of this movement being downstream to the Ohio and thence to distributing points adjacent to that stream. Continental Oil Co., as a member of the Great Lakes Pipe Line Co., also is understood to have availed itself of river transportation facilities to some extent, by making use of the reciprocal agreement existing between the Great Lakes and Phillips companies.

Some of the companies, like the Gulf and the Standard of Louisiana, have their own fleet of barges and towboats. Other companies lease the barges they use, and contract with barge lines to tow them to destination.

By following the figures as shown in the accompanying table, one can tell within certain limits the location of terminals and sources of river-borne petroleum products.

In order that the table can be interpreted more easily, it should be explained that the U. S. Army Engineering Corps has divided the river into districts, and each district reports on the volume of freight and passenger movement in or through its boundaries.

Starting at the mouth of the river, for example, the Port of New Orleans comprises one district. Another district embraces that section of the river from the northern edge of the New Orleans port district to Vicks-

burg. Others are as indicated by the table heads.

The first horizontal line of figures in the table shows the gasoline movement in 1934. Starting on the "Upbound" side of the table, it is seen that 5,178,660 barrels of gasoline moved in the New Orleans-Vicksburg district. Some of that gasoline came from the Gulf coast, some from New Orleans district refineries, and some from the Baton Rouge, La. plant of the Standard of Louisiana.

Now look at the Vicksburg-Memphis district, and remember that there is a terminal at Vicksburg used by two of the larger distributors in that area. This terminal supplies most of Kentucky Standard's requirements in Mississippi. Hence the volume of gasoline has dropped by the time it gets into the district just south of Memphis.

There are three terminals at Memphis. The volume from Memphis to the Ohio river accordingly shows a further drop, almost half the volume that was in the district just below Memphis.

It is interesting to note, then, what happens when the mouth of the Ohio river is reached. Virtually all the gasoline has swung into the Ohio river. Most of the 4134 barrels shown in the Cairo-St. Louis district undoubtedly moved from the St. Louis-Wood River refining district upstream to the mouth of the Illinois river. It is doubtful if any of the gasoline from the Gulf or lower Mississippi valley is included in that figure.

For comparative purposes observe the "Downbound" side of the table. From the St. Louis area to the mouth of the Ohio, the volume totaled 665,908 barrels. But from the mouth of the Ohio at Cairo to Memphis, the volume dropped to 170,187 barrels. The remainder of that gasoline turned up the Ohio river. And by the time the Vicksburg-Memphis district is reached there is a relatively small volume of gasoline moved downstream.

But when the New Orleans-Vicksburg district is reached, in which again is the Baton Rouge refinery, there is a tremendous increase in downstream shipments, for coastwise and export.

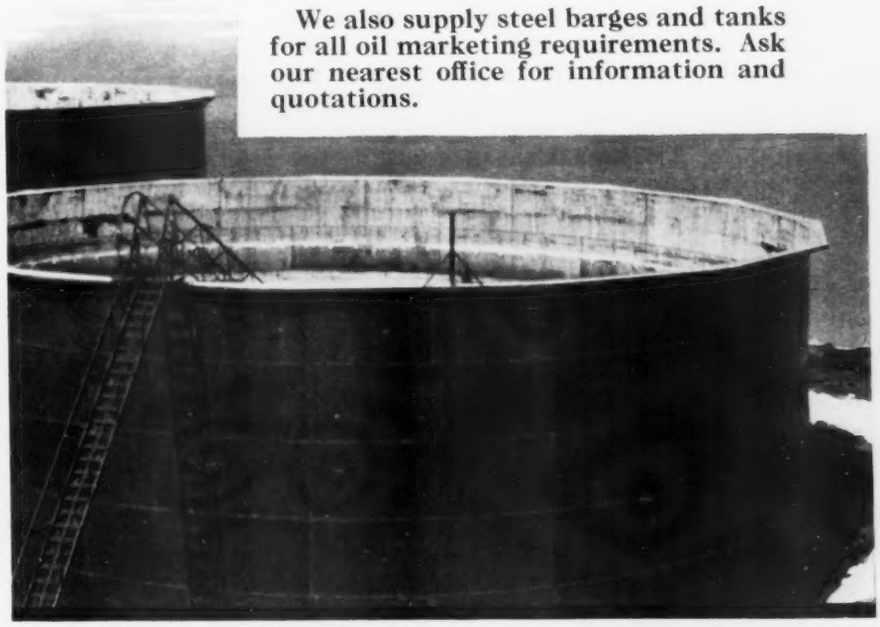
Modern Tanks for Marine Terminals

STOPPING evaporation losses from storage tanks is an important problem at any marine terminal. It not only saves a definite portion of the volume, but maintains the quality of the entire stock held in storage.

Wiggins Pontoon roofs, shown below, are used extensively to prevent evaporation loss from working tanks. They rise and fall with changing liquid level, keeping in oil vapor and keeping out air at all times.

Hortonspheroids stop evaporation loss by permitting interior pressure to build up. For ordinary motor fuel two or three pounds is adequate under most climatic conditions. Such containers can be built in large sizes—almost without limit—at a reasonable unit cost. 60,000 and 80,000-bbl. installations are shown above.

We also supply steel barges and tanks for all oil marketing requirements. Ask our nearest office for information and quotations.



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New York.....2147—165 Broadway Bldg.
Philadelphia...1616—1700 Walnut St. Bldg.
Boston.....1516 Consolidated Gas Bldg.
Detroit.....1514 Lafayette Bldg.
Dallas.....1241 Dallas Athletic Club Bldg.
Birmingham.....1536 N. Fiftieth St.
Houston.....2919 Main St.
Tulsa.....1606 Thompson Bldg.
San Francisco.....1054 Rialto Bldg.
Los Angeles.....1322 Wm. Fox Bldg.

Fabricating plants in Chicago, Birmingham and Greenville, Pa.

The Intracoastal Canal project, which eventually will reach from the Mississippi river to Brownsville, Texas, has been completed as far west as Houston. The map shows the proposed complete route of the canal and the ports it will touch. The point where the canal touches the Mississippi river at Plaquemine, La., is only a few miles below Baton Rouge

By Allen S. James N. P. N. Staff Writer

New Intracoastal Canal System Links Gulf Oil Ports to Mississippi

A DEFINITE increase of interest is shown in water transportation of petroleum products from Texas refineries to consuming areas adjacent to the Gulf and the navigable streams that are accessible along that shore line.

This is due largely to the opening, about a year ago, of the section of the Intracoastal Canal from Houston to the Mississippi river. The canal is a landlocked inland waterway with a bottom width of 100 feet and a minimum channel depth of 9 feet. While several miles inland at most points the canal's course generally is parallel to the coast line from Galveston, where it joins the Houston Ship Channel, to Morgan City, La.

The canal forks at Morgan City, one branch going directly east to the Mississippi river opposite New Orleans. The other fork goes northward to Plaquemine, La., where it touches the Mississippi river, approximately 112 miles by river route above New Orleans.

All of the Texas coast refiners from Houston eastward either are on the canal or can reach it without having to go off-shore with their barges.

The more important consuming areas now accessible by way of the canal include Houston, Texas City, Galveston, Port Arthur, Beaumont and Orange, in Texas, and Lake Charles, Abbeville, New Iberia, Crowley, Morgan City, Houma and New Orleans in Louisiana.

Some of the larger refiners along the Texas coast and lower Mississippi river, already experienced in and equipped for water transportation, were the first to take advantage of the possibilities offered by the canal.

Opening of the canal will permit more direct and faster movement of crude oil by barge to various refineries. The canal is deep enough to handle a 7000 to 8000-barrel barge, and oil can be picked up more easily from storage tanks along the canal and adjacent to the innumerable small fields along the Gulf coast.

The crude can be moved either to the Texas refineries, or direct to the plants on the lower Mississippi, or even up the Mississippi to more inland points.

Many close students of distribution and marketing see in the Intracoastal Canal, however, broader possibilities than those which already have been outlined. The prediction apparently is general among them that as this new water development becomes more generally known throughout the south, southeast and central sections of the United States, even greater interest will be created in water transportation.

For years some of the Texas coast refiners, and for that matter, some of the inland Texas refiners, have moved a portion of their output around the coast to the Mississippi, Tom Bigbee, Alabama and Warrior rivers, and up those streams to distributing points far inland. Most of this movement has been by tanker to terminals either on the coast or on the lower Mississippi, although a sizeable portion has moved by large barges around the coast and up the Mississippi river particularly.

When the commodity was moved by tanker, it meant that the cargo had to be discharged into terminal storage, then reloaded into barges for movement up those rivers. The Mississippi river, for example, has a channel stage of about 9 feet above Baton Rouge, La., although the port at that large refining and manufacturing center can accommodate the deepest draft ocean liners.

When the oil was moved by barges, it meant a long, off-shore drag around to the mouth of the Mississippi river, or to the bay at Mobile.

With only two or three exceptions most of the oil moved that way was from the larger refiners who had their own barge and tanker equipment. One company with a plant on the Houston ship channel has been moving gasoline as far up the Mississippi and Ohio rivers as Pittsburgh, but that gasoline was carried by tanker off-shore and through the mouth of the Mississippi river to a commercial terminal above New Orleans. It was stored at that terminal for later barging up the river.

The Intracoastal Canal makes possible a different picture to

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Everyone's talking about POLYmerization—developed, perfected, and introduced by Phillips. And Phillips is telling the world . . . Phillips 66 is proving to the world . . . that wise motorists Phill-up with Phillips.

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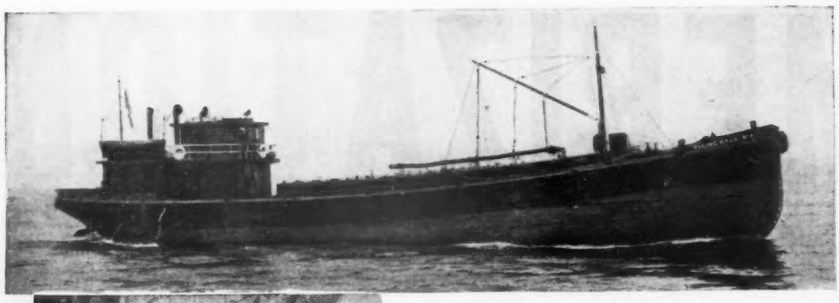

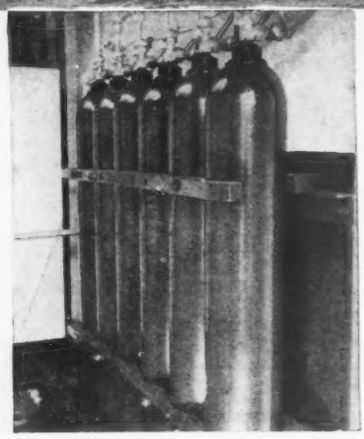

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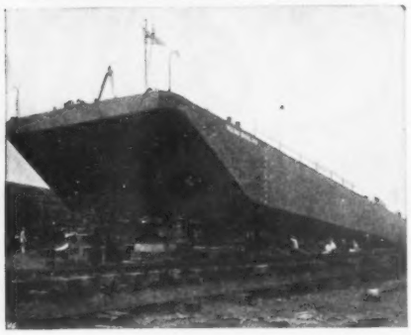
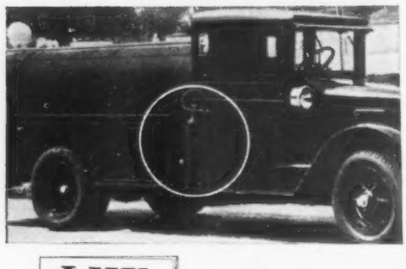


Above—Two LUX protected boats and typical LUX system.
Below—LUX protected terminal and tank truck.



ON HUNDREDS of navigable waterways throughout the land oil tankers and barges are a familiar sight. Oil can be delivered in bulk by water much more cheaply than it can be transported by rail in tank cars. Savings upwards of a cent per gallon are effected—But—the additional fire hazards involved must be protected—the oil must reach the consumer on time.

You can banish the fire worry right through from refinery to tank truck delivery with LUX equipment. Hundreds of tanker and barge owners today are depending on Lux and Lux-O-Matic systems to handle this problem effectively. Twenty-six tankers in one large oil company's fleet alone have LUX systems on board.

What is the LUX system? It employs the same LUX carbon dioxide gas that protects refineries, terminals and tank trucks. On boats this harmless fire killing gas is piped into fire hazard areas and discharged through strategically installed shielded nozzles to instantly smother fire through the creation of an inert atmosphere. Control, automatic or manual, of the release of this gas from its storage cylinders is effected safely away from the fire area.

Our engineering force is at your service in the solution of any oil fire protection problem. The experiences of thousands of successfully LUX defeated oil fires is your guarantee. Prices on portables begin at $14.00, on systems at $60.00. Complete information is available promptly. Write to

LUX SNUFFS OUT FIRE

Walter Kidde & Company, Inc.

106 **West St., Bloomfield, N. J.**

FOR PROTECTION
OF ALL OIL AND ELECTRICAL FIRES

many refiners and distributors.

In the first place, the canal eliminates necessity of off-shore shipments, and smaller barge lots accordingly can be dispatched through the canal. Then there is the matter of distance and quicker arrival at destination.

The canal from Galveston to the Mississippi river opposite New Orleans, for example, is approximately 363 miles in length. It is 371 miles from Galveston to the Plaquemine locks, approximately 112 miles by river above New Orleans. The distance from Galveston to New Orleans by way of the Gulf and the mouth of the Mississippi river, is approximately 400 miles.

It can be seen readily, therefore, that barges could be loaded at any of the Texas coast refineries, moved through the Intracoastal Canal to the Mississippi river at Plaquemine if the shipment is to go up that stream, and then could be towed on up the river without necessity of changing the cargo from one type of barge to another.

That situation, it is believed in many quarters, offers an excellent opportunity for independent distributors in certain areas of the central, south and southeastern U. S. to "get together" with inland Texas and Louisiana refiners on this matter of rail-water transportation of their supplies. Gasoline could be purchased in East Texas refining district, for example, and moved on a coastwise rail rate of 13 cents per 100 pounds to a Gulf port. There are several public terminals along the coast. The gasoline could then be loaded in barges, and moved through the canal to destinations far inland and even could be trucked farther inland from the river terminals. The inland refiners, of course would have to quote prices comparable, freight and terminaling considered, to prices of the coast refiners.

For movement inland from the Gulf coast east of Louisiana, the barges could be taken through the Harvey locks at New Orleans, across the river and through the canal into lake Pontchartrain, thence into Lake Borgne and into the Mississippi Sound and on along the coast

to the various terminals.

Reports indicate the railroads serving much of the refining area in Texas have been quick to see the possibilities, and already are considering steps to meet the anticipated competition.

The railroads, it has been indicated, are considering seriously making a request for permission to establish special trainload rates on petroleum products to certain river crossings, such as Memphis and St. Louis, where the oil could be moved to final destination by barge, these rates to the river crossings plus the cost of barging to final destination being comparable to the cost of all-water transportation of the commodity.

To Link Brownsville To Gulf via Canal

DALLAS, Texas, Oct. 12.—Two major oil companies with extensive distribution in Texas already have made plans to take advantage of the water transportation facilities that will be provided when Brownsville, Texas, becomes a port.

Magnolia Petroleum Co. and The Texas Co. have leased sites along the turning basin which will be the terminus of the canal now being constructed from Port Isabel.

These two companies plan to construct terminals at the sites leased, to take the place of the present bulk plants. From the terminals the companies not only will be able to supply Brownsville and vicinity, but will be able to ship considerable distances inland by rail or truck.

The canal has reached that stage of completion where the railroads are discussing rate adjustments to compete with the coming water movement. Reports here indicated the railroads were considering establishing unusually low rates from the Houston, Port Arthur and Beaumont refining districts.

It was anticipated the port at Brownsville also will be used by several oil companies to transfer crude oil brought by pipeline from surrounding oil fields to barges for water transportation to refineries along the coast.

NEVER A LOSS TO A CUSTOMER

Oil Transfer Corporation owns and operates a fleet of twelve modern, properly designed, all-steel oil barges, built and maintained to the highest specifications of the American Bureau classification . . . total capacity of 130,000 barrels . . . together with modern diesel tugs, for the efficient, economical and safe transportation of bulk petroleum products for Coastwise, Harbor, Inland Waterway and Great Lakes services.

Responsibility and integrity in performance . . . year in and year out—summer or winter . . . is the essence of O.T.C. service.

The executive personnel of O.T.C. has had years of experience in the efficient transportation of highly volatile products and has a keen understanding of the chemical and engineering problems involved in safeguarding against all dangers.

O.T.C. has delivered approximately 10,000 cargoes without loss of a gallon of product and through modern equipment has assured safety of cargo and safety to terminals from fire hazards, which have in turn reduced usual insurance rates.

With properly designed barges all products loaded are delivered. Not the usual ½ or 1%, but a loss averaging less than 1/10 of 1% between intake and outtake figures. A difference of only approximately 400 gallons in every 100,000 gallon shipment.

O.T.C. sells only transportation service by water. Nothing else. The company is independently owned and not affiliated with any interest and is, therefore, in a position always to safeguard customer's confidential relationships between buyer and seller. O.T.C. does not solicit, buy or sell petroleum products—just transportation service with safety.

An O. T. C. contract is an assurance of outstanding performance.

Your inquiry will receive prompt reply

OIL TRANSFER CORPORATION, *17 Battery Place, N. Y.*

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• MARKETS •

CLEVELAND, Oct. 14

REFLECTING an active demand and a good inventory position, domestic wholesale gasoline prices were steady in most refinery districts east of the Rockies the second week of October. Export gasoline prices were stimulated by an active demand and advanced about 0.375 cent. California markets took a turn for the worse as both wholesale and retail prices were cut 1 cent.

Viewed as a whole, tank car gasoline markets were in better shape in most every district with the exception of California than they have been at any time this year, according to many market observers. Apparently there is no surplus gasoline with the possible exception of some third grade material which has had a bearish effect on the Mid-Western market.

While domestic movement of gasoline at the Gulf was confined largely to small lots, at least two cargoes were sold for export. Just how much more business was on the fire was difficult to determine, but if the crisis in Europe gets any worse there is bound to be more transactions—probably at higher prices.

The good position of the Gulf market was reflected along the eastern seaboard. Most reports indicated that offerings at seaboard terminals were closely held, with all suppliers holding to current market prices. However, some reports indicated that cheap gasoline was not too hard to find in some quarters. .

Some of the pressure on tank car prices at points along the eastern seaboard was relieved when service station prices were returned to normal in Maine, including Portland. Retail prices at some points in up-state New York and in New England continued below normal, and service station prices in Rochester were reduced 1 cent.

Mid-Continent markets remained steady at prices prevailing all summer. The increased demand for gasoline for shipment to the Gulf was keeping the market pretty well cleaned up. With the higher prices prevailing for export shipment at the Gulf, it is profitable to ship to the Gulf from a wider area. This will tend to reduce the offerings in the Mid-Continent and Mid-Western markets.

There seems to be absolutely no agreement among the various elements in the industry on the west coast as to what policies should be followed either in producing or marketing. Disagreement among majors led to last week's 1-cent gasoline cut. As bad as conditions are out there, there seems to be a feeling in some quarters that they must get worse before they can improve.

N. P. N. Gasoline Index

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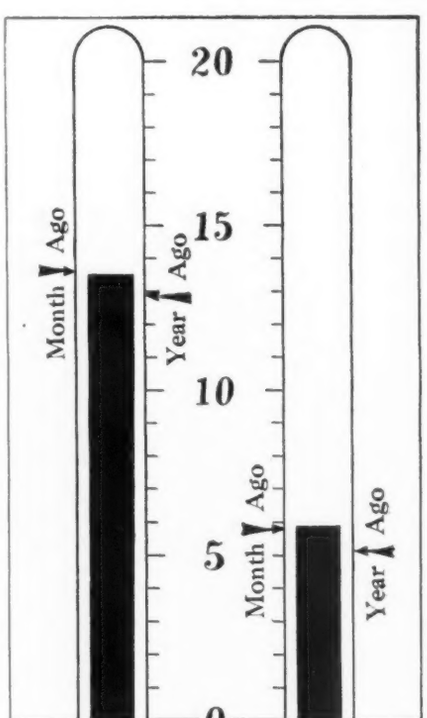


Retail index of 50 cities, ex-tax, and tank car is a weighted average of 13 wholesale markets for middle octane gasoline. The gasoline price index this week represents the following prices in cents per gallon:

Date	Retail	Tank Car
Oct. 14	13.54	5.84
Month ago	13.60	5.83
Year ago	12.90	5.11

Despite the overproduction in California, traders in other areas have so far been unable to obtain either crude or refined products for shipment to the east coast. Many observers in other districts are beginning to wonder where they are putting all the oil they are producing.

The threat of lower prices for natural gasoline materialized last week. Production has not been reduced as much as had been expected under the gas waste law of Texas. At the same time demand has not been up to expectations either. This created an unbalanced situation, which, as always, resulted in lower prices.

There seems to be some question among traders as to whether refiners have been slow in obtaining their fall and winter requirement of natural or whether they are using some other product to pep up their motor fuel.

Bright stocks, both Pennsylvania and Mid-Continent, also advanced under the stimulus of foreign buying. The third 0.5 cent advance in these prices in less than a month was, like the other two advances, the direct result of increased demand for special bright stock to be shipped out of the country. Domestic demand was none too good, but with refiners slowed up on production of lower pour and lighter colors, inventories remained at relatively low levels.

Pennsylvania neutral oil prices also advanced 0.5 cent. Demand for the lighter grades of motor oil has gotten under way, and neutrals became a bit scarce as a result. Spot offerings were not plentiful, and several refiners normally sellers of neutrals were on the buying side. Market observers were anticipating still higher prices for neutrals before many days.

There were signs of more activity in wax. A number of traders have been unable to see why prices have not advanced recently. Wax is used in the manufacture of munitions, and the recent activity in that line should have increased the demand enough to affect wax prices, they said.

DUNCAN, Okla.—L. B. Simmons, president of the Rock Island Refining Co., has returned to his office after spending a two-months vacation in Alaska and on the Pacific Coast.

Wax

Market Firm

NEW YORK, Oct. 12.—The market for crude scale wax presented a firm front during the week ended Oct. 12 and both demand and prices were steady. Occasional cars of 122-124 scale still were moving at 1.95 cents a pound, but by far the bulk of the sales and quotations reported were at a minimum of 2 cents a pound.

Refined wax prices showed little change from those which have been quoted for a number of weeks. Demand remained in steady volume, both for domestic and export movement.

Chicago

Trading Quiet

CHICAGO, Oct. 12

IN A period of extremely quiet trading the Mid-Western tank car gasoline market failed to live up to the advance predictions of many sellers the week ended Oct. 12.

Indications and reports the week ended Oct. 5 were that large companies would enter the Mid-Western market, and take up the surplus gasoline which has been exerting pressure on prices. A thorough check of Chicago sellers the past week however failed to disclose any instances where large-company buying had afforded relief.

Action of the market the past week proved disappointing to interests which had banked on a definite upturn under the impetus of tank car buying from outside sources. When this buying failed to materialize, an easier price structure ruled during the early days of the week. Some of this easiness was dissipated, however, when export buying appeared in East Texas closing that market as a source for Chicago resellers.

Shading of 4.625 cents for low octane U. S. Motor was noted about the middle of the week. As the week ended, however, virtually all sellers again were asking a minimum of 4.625 cents.

Contract takings of gasoline were reported keeping up with the record-breaking consumption indicated throughout the country. Open market buyers, on the other hand, continued to trade cautiously, which in turn was helping to unsettle spot market quotations.

The retail situation showed no change throughout the week. Subnormal prices continued in effect at many of the main station points in the Indiana Standard's territory.

While traders generally concentrated attention on gasoline and light fuel oils, kerosine, nevertheless, was a fair amount of play in the Mid-Western tank car market. A minimum of price shading was heard, and this for the most part was on questionable material. Movement was reported fair to good in virtually all quarters.

California

Prices Irregular

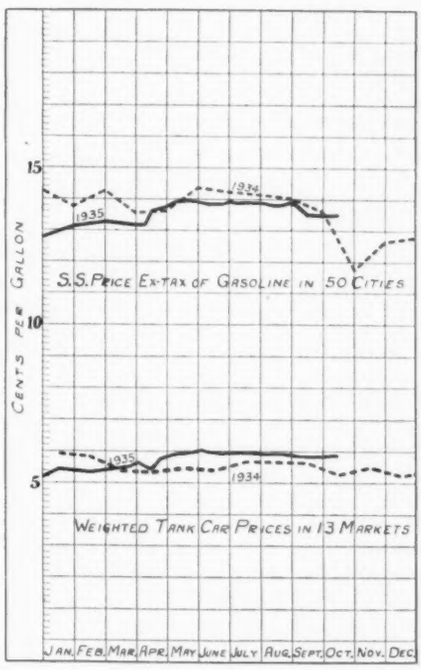
LOS ANGELES, Oct. 11

IRREGULARITY of quotations characterized all Pacific Coast petroleum markets the past week.

Reductions by major oil companies in wholesale and retail gasoline prices in the Los Angeles Basin area were initiated in an effort to prevent the granting of wide margins to dealers. The desired result was not achieved and a large number of independent service stations continued to receive price concessions from major refiners or their affiliates.

Inability of producers and refiners to agree upon a crude production program also contributed to the instability of all markets.

Reduction of gasoline prices made Oct. 9, the second within two weeks, brought tank wagon quotations on major company third-grade brands to 8.5 cents a gallon, including 4 cents tax, delivered to points in the Basin area. Some major company standard brands, however, were reported available at 7.5 cents a gallon, delivered in the same territory, through secondary companies. Independent competitive brands of gasoline were offered at about these same prices, or at fractionally lower levels when necessary to maintain outlets.



Trend of N.P.N. gasoline index during the past year comparing weighted average tank car prices in 13 markets with retail prices ex tax in 50 cities. See chart on page 100 for current index levels

Natural gasoline prices were soft, with quotations tending downward. Considerable quantities were reported available at 5 cents a gallon and some distress product at 4.75 cents a gallon.

Irregularity of quotations in the San Joaquin Valley included fuel oil and stove distillate, in addition to gasoline. Overproduction of all petroleum products, coupled with keen competition and a restricted market, caused considerable quantities of fuel oil and heavy crude oil to be offered at distress prices. Although the general level of prices for fuel oil in the Valley was about 55 cents a barrel for independent products, sales at as low as 45 cents a barrel were reported. Stove distillate, generally quoted at $1.25 by independent refiners in that area, was reported available at $1.05 a barrel. These, however, were not firm quotations.

Although less affected than the central and southern sections of the state, northern California also was troubled with local price wars that threatened to involve the whole of the state. The instability has not spread to Oregon and Washington, where abnormal quantities of gasoline are at present carried in storage.

Pacific Coast seaboard markets were inactive, with no important changes in nominal quotations. Although many inquiries were received, little spot business resulted and shipments were generally made under contract.

Eastern

Export Prices Higher

NEW YORK, Oct. 12

EXPORT gasoline prices took a sharp upward turn during the week ended Oct. 12, climaxing a two weeks' period of gradually improving conditions. Domestic cargo markets were dull.

Reports of numerous sales and inquiries from foreign buyers, particularly French, were heard in export circles throughout the week, but definite information was hard to obtain. Several exporters who were reported to have made sales of 64-66, 375 e.p. gasoline at prices ranging from 4.875 to 5.375 cents, f.o.b. the Gulf denied doing so, but it appeared fairly certain that at least two cargoes were closed during the week by American sellers.

Regardless of whether or not there were any sales actually closed, there was a definite sharp upward turn in the market and suppliers at the end of the week were asking at least

0.375 cents higher than when the week began.

Asking prices of at least 5 cents for U. S. Motor and 5.25 to 5.375 cents for 64-66, 375 e.p. gasoline prevailed among Gulf suppliers on Oct. 11, compared to quotations of 4.625 cents and 4.875 cents, respectively, on Oct. 7.

Indications were that prices of American suppliers might have moved even higher during the week than they did, except for the entry into the market of some foreign sellers. At least two cargoes of 64-66, 375 e.p. gasoline were reported closed abroad with the gasoline not to move from the American Gulf.

Persistent reports were heard that the Italian government was purchasing petroleum products in this country, but American exporters active in the market said they were unable to locate any of this buying. The feeling was widespread, however, that if the European muddle continued getting worse there would be a heavier demand for American products, with a consequent increase in prices.

Domestic gasoline movement from the Gulf was far from active, at least for full cargo lots. Some small-lot business was reported at prices which have prevailed for several weeks.

Kerosine demand was slack, although suppliers said they were not trying to force it on the market at present. Prices of this product were fairly steady, although rather hard to determine in view of the lack of cargo buying.

Fuel oils at the Gulf also were without much change. Both domestic and export inquiries were lacking during the past week.

Coastal

Markets in Fair Shape

NEW YORK, Oct. 12

TANK car and barge gasoline markets at eastern seaboard terminals apparently were in fair shape in the week ended Oct. 12. Suppliers reported there was no surplus gasoline available and that conditions generally were fine. On the other hand some buyers said they were receiving more offerings of gasoline and that unsettled conditions in the retail markets disclosed cheaper gasoline coming from some sources.

The retail picture was more encouraging as a result of a general restoration to normal prices of points in Maine which had been sub-normal. Portland was included in this advance. On the debit side of the picture occurred another reduction in retail gasoline prices at Rochester and continued below normal prices at many other New York and New England points.

Eastern traders continued to watch closely the California crude oil markets, in the hope of picking up any cheap material that was available and ship it into New York harbor. They reported that so far, at least, they had been unable to do much business along this line. Nevertheless, continued overproduction in California encouraged the belief that it was possible there would be some eastern movement of these products.

Reports of the American Petroleum Institute on shipments of California oil to Atlantic and Gulf Coast ports during the week ended Oct. 2 supported the fact that so far the California crude cuts have not resulted in dumping of goods on the east coast.

The A.P.I. reported that receipts of California oil at Atlantic and Gulf ports were only 11,429 barrels on daily average in the week ended Oct. 5, compared to daily average of 24,000 barrels for the month of September.

Kerosine markets continued unsettled along the eastern seaboard, although there apparently was no actual cutting of prices in volume heavy enough to force a drastic break. Reports of shading were heard at several points, however.

Mid-Continent

Texas Natural Easier

TULSA, Oct. 12

NATURAL gasoline prices in Texas crumpled under the pressure of increased offerings the week ended Oct. 12.

An unsettled market has existed in Texas for the past few weeks. Production has been high, jobber business light, and export and coastwise orders small in volume. The result has been a market top-heavy with supplies.

During the summer months manufacturers with storage at the Gulf began storing stabilized natural for sale this fall to major refiners on the east coast and to foreign buyers. In most cases, manufacturers laid in additional stocks at the Gulf in anticipation of a shortage of supplies coming from the Texas Panhandle.

Natural production in the Panhandle, however, was not curtailed as drastically as was expected. Today production in that district is only slightly under what it was before enactment of the gas waste law. Injunctions have lifted several manufacturers out of the jurisdiction of the law temporarily.

Movement of natural gasoline to jobbers over the past few weeks has been light. Present prices have prohibited the use of low vapor pressure grades and only minimum amounts of Grade 26-70 have been used.

Movement of natural in coastwise and export channels, exclusive of regular contract commitments, has been extremely light of late. The expected demand from east coast refiners for natural to pep up winter gasoline and for storage at inland terminals for blending has fallen short of expectations. Either the major purchasers of natural are using butane and other light ends to impart volatility to their motor fuel or they are holding out unusually late this year.

The few spot inquiries that have developed for export or coastwise natural have had a detrimental rather than a beneficial effect on the market. Inquirers, upon receipt of quotations, immediately began shying away. They threatened to purchase requirements on the Pacific coast at prices under those quoted at the Gulf. As far as could be checked this threat was never carried out. There have been occasional cargoes sold at the Gulf at under present price levels.

Conditions at the Gulf have discouraged the storing of additional natural, especially on the basis of 4 cents for Grade 26-70. So instead of shipping their natural to the Gulf, manufacturers attempted to dispose of it on the domestic market.

It was natural gasoline that normally moved to the Gulf that unsettled the market and eventually led to a 0.375-cent reduction in Texas prices.

At present prices observers believed movement of natural would increase sufficiently to relieve the market of excess offerings. And should the expected export and coastwise business materialize, the market again would rally quickly.

The reduction in Texas natural gasoline widened the differential between Oklahoma and Texas Grade 26-70. But since there was so little Texas natural sold on a Group 3 basis, the Oklahoma Group 3 price was maintained at 4.125 cents. How long this condition will last is a question. Everyone admits that a 0.5-cent differential is unusual and will not last for long. Should Texas prices incline upward, they say, Oklahoma prices might be held.

Refined gasoline markets held surprisingly well during the second week of October. Prices were well pegged at levels established several months ago.

The East Texas gasoline situation was described as the best in several months. Supplies were unusually scarce. Refiners for the most part were sold up and refusing to consider orders for low octane gasoline at 4.625 cents Group 3. Resale agents in that district advanced selling prices

(*Continued on page* 116)

Pennsylvania

Lubes Higher

CLEVELAND, Oct. 12

THE sustained demand for bright stock and neutral oils was reflected in another 0.5-cent advance in prices of these products in the Pennsylvania market in the second week of October. Most other products were generally steady, with offerings somewhat scarce in some quarters.

Neutral oils were getting more play as the seasonal demand for the lighter grades of motor oil got under way. Little material was offered on the open market, and practically all of this was absorbed before the end of the week.

If the demand continues to exceed the supply, traders generally believed that another advance in prices will be made by refiners. Several refiners who are normally sellers of neutral oil were in the market as buyers. They found their production was not sufficient to meet the current demand.

Buying from foreign quarters continued to keep the bright stock market free of any excess offerings. As a matter of fact, most refiners were refusing to sell on the open market. The domestic demand for bright was not particularly good, but with so many refiners producing a light color and lower pour test material for shipment out of the country, inventories of the regular grade remained at a relatively low level.

The position of 65 octane gasoline remained firm. There was comparatively little material available for spot shipment. A few sellers were inclined to mark up their prices, but most of them apparently were satisfied with the present price of 6.75 cents.

Owing to the good demand for 65 octane gasoline cracking operations were maintained at a high rate. This aided the kerosine and fuel oil markets. With kerosine-distillate moving to the crackers in good volume, offerings of the finished material were pretty well in line with demand. Competition from other refinery districts was holding the price down in the lower field, but Bradford-Warren district refiners were in good shape and some talk was heard there of advancing prices again.

The crackers also were taking considerable quantities of fuel oil. The approach of the heating season was expected to increase the demand for fuel oil. With supplies of fuel oil fairly tight throughout the field, higher prices were predicted in some quarters.

There was little change in the status of U. S. Motor gasoline. Reports indicated that offerings were not quite so plentiful, but demand also was none too good.

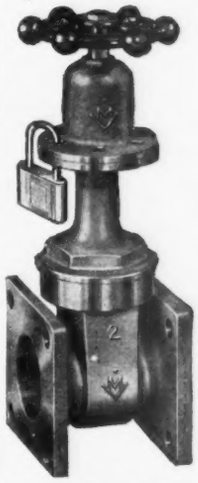
The presence of this Seal on the drums and cartons in which you receive your lubricating oil is your guarantee that the product has been made from the finest Pennsylvania Bright Stock obtainable . . . Watch for it.

THE CONEWANGO REFINING CO., Warren, Pa.

WITH "MILWAUKEE" VALVES & FITTINGS

DELIVERY COSTS GO DOWN

The Approved "MILWAUKEE" line of Valves and Fittings for the Oil Industry provide additional economies because they give longer, more dependable service. Nearly a third of a century of experience in the manufacture of finer valves and fittings is reflected in each "MILWAUKEE" product.



No. 422 Flanged Gate Valve with locking provision

STEMLOCK GATE VALVE

An exclusive "MILWAUKEE" development . . providing a superior, more reliable locking feature. The square section of the stem is locked against turning and the stuffing nut is fully enclosed.

Thirty different locking positions are made possible by the locking collar and flange combination.

Also made with built-in by-pass relief which permits excess pressure to be by-passed around the discs.

No. 851 Truck Tank Faucet

TRUCK TANK FAUCET
With Permadisc Construction

Permadisc construction with the Permilene disc is another exclusive "MILWAUKEE" development embodied in the "MILWAUKEE" Truck Tank Faucet.

The PERMILENE disc is held rigidly in proper seating position at all times within the disc holder insuring positive seating accuracy with no disc distortion.

Send for complete catalog and price information on "MILWAUKEE" Valves and Fittings for the Oil Industry.

MILWAUKEE VALVE COMPANY

MILWAUKEE **WISCONSIN**

Manufacturers of Approved "Milwaukee" Valves and Fittings for the Oil Industry

REFINERY TANK CAR MARKETS

Prices in cents per gallon, tank car lots, except where otherwise noted. Prices are those to domestic jobbers who resell to consumers. They do not represent inter-refinery sales, or sales for export. Federal, state or municipal taxes not included. Prices quoted apply on products made from legally produced crude.

Gasoline *and* Naphtha

	Oct. 14	Oct. 7	Sept. 30
Oklahoma			
48-54, 450 e.p. naphtha....	4.625– 4.75	4.625– 4.75	4.625– 4.75
U. S. Motor gasoline, by octane numbers:			
62 and below (3rd grade)	4.75 – 4.875	4.75 – 4.875	4.75 – 4.875
63-70 octane (regular)..	5.625– 5.75	5.625– 5.75	5.625– 5.75
71 and above.....	.....	.....	.....
60-62, 400 e.p. gasoline....	4.75 – 4.875	4.75 – 4.875	4.75 – 4.875
64-66, 375 e.p. gasoline....	4.875– 5.00	4.875– 5.00	4.875– 5.00
68-70, 350-360 e.p. gasoline	5.00 – 5.125	5.00 – 5.125	5.00 – 5.125
Western Penna. (Quotations and/or sales prices to car unloaders)			
Bradford-Warren:			
52-54 naphtha.....	5.00 – 5.125	5.00 – 5.125	5.00 – 5.125
Motor gasoline:			
U. S. Motor (58-62°)...	5.125– 5.25	5.125– 5.25	5.125– 5.25
Minimum 60 octane....	6.50 – 6.625	6.50 – 6.625	6.50 – 6.625
Minimum 65 octane....	6.75 – 6.875	6.75 – 6.875	6.75 – 6.875
Minimum 70 octane....	.....	.....	.....
64-66, 390 e.p. gasoline....	5.375– 5.50	5.375– 5.50	5.375– 5.50
68-70, 350-360 e.p. gasoline	5.625– 5.75	5.625– 5.75	5.625– 5.75
Other districts:			
52-54 naphtha.....	5.00 – 5.125	5.00 – 5.125	5.00 – 5.125
54-56 naphtha.....	5.125 5.25	5.125– 5.25	5.125– 5.25
Motor gasoline:			
U. S. Motor (58-62°)....	5.125– 5.25	5.125– 5.25	5.125– 5.25
Minimum 60 octane....	6.50 – 6.625	6.50 – 6.625	6.50 – 6.625
Minimum 65 octane....	6.75 – 6.875	6.75 – 6.875	6.75 – 6.875
Minimum 70 octane....	.....	.....	.....
64-66, 390 e.p. gasoline....	5.375– 5.50	5.375– 5.50	5.375– 5.50
68-70, 350-360 e.p. gasoline	5.625– 5.75	5.625– 5.75	5.625– 5.75
California (3c tax to be added to prices if used in state)			
54-58 U. S. Motor, 437 e.p. for in-state shipment....	3.50 – 5.00	3.50 – 5.00	3.50 – 5.00
54-58 U. S. Motor, 437 e.p. for outside state shipment	3.50 – 5.00	3.50 – 5.00	3.50 – 5.00
58-61,375-400 e.p. gasoline, 65 octane and above....	5.50 – 6.50	6.00 – 7.00	5.00 – 6.50
†***North Texas*** (F.o.b. Wichita Falls district for shipment to Texas and New Mexico destinations; Group 3 prices quoted on northern shipments).			
U. S. Motor gasoline, by octane numbers:			
62 and below (3rd grade)	4.75	4.75	4.75
63-70 octane (regular)..	5.625	5.625	5.625
71 and above.....	.....	.....	.....
60-62, 400 e.p. gasoline....	4.75 – 4.875	4.75 – 4.875	4.75 – 4.875
64-66, 375 e.p. gasoline....	4.875– 5.00	4.875– 5.00	4.875– 5.00
68-70, 350-360 e.p. gasoline	5.00 – 5.125	5.00 – 5.125	5.00 – 5.125
Kansas (F. o. b. refinery, Kansas destination)			
U. S. Motor gasoline, by octane numbers:			
62 and below (3rd grade)	5.00 – 5.125	5.00 – 5.125	5.00 – 5.125
63-70 octane (regular)..	5.875– 6.00	5.875– 6.00	5.875– 6.00
71 and above.....	.....	.....	.....
60-62, 400 e.p. gasoline....	5.00 – 5.125	5.00 – 5.125	5.00 – 5.125
†***West Texas and New Mexico*** (F. o. b. W. Texas and N. Mex. refinery for unrestricted shipment)			
U. S. Motor gasoline, by octane numbers:			
62 and below (3rd grade)	4.75 – 4.875	4.75 – 4.875	4.75 – 4.875
63-70 octane (regular)..	5.625– 5.75	5.625– 5.75	5.625– 5.75
71 and above.....	.....	.....	.....
†***East Texas*** (F. o. b. East Texas refinery for unrestricted shipment)			
U. S. Motor gasoline, by octane numbers:			
62 and below (3rd grade)	4.625– 4.75	4.625	4.625
63-70 octane (regular)..	.....	.....	.....
71 and above.....	.....	.....	.....
60-62, 400 e.p. gasoline....	4.625– 4.75	4.625– 4.75	4.625– 4.75
North Louisiana (For Louisiana and Arkansas destination)			
U. S. Motor gasoline:			
62 octane and below....	5.50	5.50	5.50
63-70 octane number....	6.25	6.25	6.25
71 octane and above....	.....	.....	.....
Arkansas (For Arkansas and Louisiana destination)			
U. S. Motor gasoline:			
62 octane and below....	5.50	5.50	5.50
63-70 octane number....	6.25	6.25	6.25
71 octane and above....	.....	.....	.....

•Nominal. †Refiners generally receive from 0.25c to 0.5c per gallon more for gasoline and kerosine for local or differential territory shipment.

	Oct. 14	Oct. 7	Sept. 30
Ohio (Quotations of S. O. Ohio. Delivered any point in Ohio).			
U. S. Motor gasoline.....	8.375	8.375	8.375
Above 65 octane number..	8.625	8.625	8.625

Natural Gasoline

(Prices shown f.o.b. Group 3 and Breckenridge represent majority of sales made on dates shown to blenders on the freight basis shown below, although shipments may originate in other manufacturing districts, such as East Texas, Panhandle, Southwest Texas or Kansas).

F.o.b. Group 3			
Grade 26-70.....	4.125	4.125	4.125
F.o.b. Breckenridge			
Grade 26-70.....	3.625– 3.875	3.75-4.00	4.00
California (F. o. b. plants in Los Angeles basin)			
75-85, 375-390 e.p. for blending.....	5.00 – 5.75	5.25 – 5.75	5.25– 5.75

Kerosine

Western Penna. (Quotations and/or sales prices to car unloaders)			
Bradford-Warren:			
45 w.w. kerosine.....	4.75 – 4.875	4.75 – 4.875	4.625– 4.75
46 w.w. kerosine.....	4.875– 5.00	4.875– 5.00	4.75 – 4.875
47 w.w. kerosine.....	5.00 – 5.125	5.00 – 5.125	4.875– 5.00
Other districts:			
45 w.w. kerosine.....	4.625– 4.75	4.625– 4.75	4.625– 4.75
46 w.w. kerosine.....	4.75 – 4.875	4.75 – 4.875	4.75 – 4.875
47 w.w. kerosine.....	4.875– 5.00	4.875– 5.00	4.875– 5.00
Ohio (Quotations of S. O. Ohio. Delivered any point in Ohio).			
Kerosine.....	6.00	6.00	6.00
Oklahoma			
41-43 w.w. kerosine.....	3.375– 3.50	3.375– 3.50	3.375– 3.50
42-44 w.w. kerosine.....	3.50 – 3.625	3.50 – 3.625	3.50 – 3.625
Kansas (F. o. b. refinery ,Kansas destination)			
41-43 w.w. kerosine.....	3.875– 4.00	3.875– 4.00	3.875– 4.00
42-44 w.w. kerosine.....	4.00 – 4.125	4.00 – 4.125	4.00 – 4.125
†***North Texas*** (F.o.b. Wichita Falls district for shipment to Texas and New Mexico destinations; Group 3 prices quoted on northern shipments).			
41-43 w.w. kerosine.....	3.50	3.375– 3.50	3.375– 3.50
†***East Texas*** (F.o.b. East Texa refinery for unrestricted shipment)			
41-43 w.w. kerosine.....	3.25	3.25	3.25
North Louisiana (For Louisiana and Arkansas destination)			
41-43 w.w. kerosine.....	3.75	3.75	3.75
Arkansas (For Arkansas and Louisiana destination)			
41-43 w.w. kerosine.....	4.25	4.25	4.25
California (F.o.b. California refineries)			
38-40 w.w. kerosine.....	4.00 – 5.00	4.00 – 5.00	3.25 – 5.00

Gas *and* Fuel Oils

Western Penna. (Quotations and/or sales prices to car unloaders)			
Bradford-Warren:			
36-40 fuel oil.....	4.125– 4.25	4.125– 4.25	4.125– 4.25
‡*Other districts*:			
36-40 fuel oil.....	4.00 – 4.125	4.00 – 4.125	4.00 – 4.125
‡Not including Pittsburgh.			
Oklahoma (F.o.b. Oklahoma refineries)			
Gas oils:			
No. 1 white.....	3.125– 3.25	3.125– 3.25	3.125– 3.25
No. 1 straw.....	3.00 – 3.125	3.00 – 3.125	3.00 – 3.125
No. 2 straw.....	3.00	3.00	3.00
No. 2 dark.....	2.875– 3.00	2.875– 3.00	2.875– 3.00
U. G. I. gas oil.....	2.25 – 2.375	2.25 – 2.375	2.25 – 2.50
Fuel oils: (Prices per barre of 42 U. S. gallons)			
28-30, zero.....	$1.15 –$1.175	$1.125–$1.15	$1.125–$1.15
28-30.....	$1.00	$1.00	$1.00
24-26.....	$0.70 –$0.75	$0.70 –$0.75	$0.70 –$0.75
18-22.....	$0.70 –$0.725	$0.70 –$0.725	$0.70 –$0.725
14-16.....	$0.60 –$0.625	$0.60 –$0.625	$0.60 –$0.625

(*Continued on page* 106)

CHAMPLIN'S JOBBER POLICY

FAIR PLAY

THE Champlin policy of Fair Play carries the approval of jobbers and dealers through-out the territory. Champlin is an Independent Refiner and has consistently championed the cause of the Independent Jobber. Champlin believes this type of Jobber is essential to the sound growth of the oil industry.

Champlin Jobbers and Dealers know the value of this policy of Fair Play.

CHAMPLIN REFINING COMPANY
ENID, OKLAHOMA

CHAMPLIN

PRODUCTS MAKE YOUR PROFITS

CHAMPLIN GASOLINE
USE CHAMPLIN OILS
CHAMPLIN MOTOR OILS
USE CHAMPLIN OILS

Champlin Advertising tells motorists

HITCH YOUR MOTOR TO STAR PERFORMANCE—"Use CHAMPLIN Products"

PRICES in the various petroleum markets quoted regularly in National Petroleum News are compiled by the staff of Platt's Oilgram, an affiliated daily oil market reporting service. Barrels are of 42 U. S. gallons. Prices appearing in each issue of National Petroleum News are the same as those carried in the Monday edition of the Oilgram. For information regarding the Oilgram daily news and market service write Platt's Oilgram, Cleveland.

(*Continued from page* 104)

	Oct. 14	Oct. 7	Sept. 30
Kansas (F.o.b. refinery, Kansas destination)			
No. 1 straw	3.375	3.375– 3.50	3.25 – 3.375
18-22 fuel oil (per bbl.)	$0.725–$0.75	$0.725–$0.75	$0.725–$0.75
10-14 fuel oil (per bbl.)	$0.625–$0.65	$0.60 –$0.65	$0.60 –$0.65
North Texas (F.o.b. Wichita Falls district for shipment to Texas and New Mexico; Group 3 prices quoted on northern shipments).			
No. 1 straw	3.125	3.00 – 3.125	3.00 – 3.125
No. 1 white	3.25	3.125– 3.25	3.125– 3.25
No. 2	3.00	2.875– 3.00	2.875– 3.00
U.G.I. gas oil	2.25 – 2.375	2.25 – 2.375	2.25 – 2.375
24-26 fuel oil (per bbl.)	$0.70 –$0.725	$0.70 –$0.725	$0.70 –$0.725
18-22 fuel oil (per bbl.)	$0.65 –$0.675	$0.65 –$0.675	$0.65 –$0.675
West Texas (F.o.b. West Texas refineries for unrestricted shipment).			
No. 2	*2.75 – 2.875	*2.75 – 2.875	*2.75 – 2.875
18-22 fuel oil (per bbl.)	$0.65	$0.65	$0.65
East Texas (F.o.b. East Texas refineries for unrestricted shipment).			
No. 1 white	*3.00 – 3.125	*3.00 – 3.125	*3.00 – 3.125
No. 2	*2.875	*2.875	*2.875
U.G.I. gas oil	2.125– 2.25	2.125– 2.25	2.125– 2.25
24-26 fuel oil	$0.575–$0.60	$0.575–$0.60	$0.575–$0.60
20-24 fuel oil	$0.575	$0.575	$0.575
North Louisiana (For Louisiana and Arkansas destination).			
No. 2	3.125– 3.25	3.125– 3.25	3.125– 3.25
U.G.I. gas oil	2.875– 3.00	2.875– 3.00	2.875– 3.00
20-24 fuel oil	$1.00 –$1.025	$1.00 –$1.025	$1.00 –$1.025
16-20 fuel oil	$0.90 –$0.925	$0.90 –$0.925	$0.90 –$0.925
10-14 fuel oil	$0.75 –$0.80	$0.75 –$0.80	$0.75 –$0.80
Arkansas (For Arkansas and Louisiana destination)			
No. 2	3.50	3.50	3.50
28-30 gas oil, zero	3.25	3.25	3.25
20-24 fuel oil (per bbl.)	$0.825–$0.875	$0.825–$0.875	$0.825–$0.875
16-20 fuel oil	$0.725–$0.775	$0.725–$0.775	$0.725–$0.775
10-14 fuel oil	$0.6[illegible]65	$0.60 –$0.65	$0.60 –$0.65
California			
San Joaquin Valley, per bbl.:			
Grade C fuel oil	$0.50 –$0.75	$0.60 –$0.75	$0.60 –$0.75
Diesel fuel oil	$1.05 –$1.45	$1.05 –$1.45	$1.05 –$1.45
Stove distillate	$1.25 –$1.85	$1.25 –$1.85	$1.25 –$1.85
Los Angeles, per bbl.:			
Grade C fuel oil	$0.65 –$0.95	$0.65 –$0.95	$0.65 –$0.95
Diesel fuel	$1.10 –$1.45	$1.10 –$1.45	$1.10 –$1.45
Stove distillate	$1.25 –$1.85	$1.25 –$1.85	$1.25 –$1.85
San Francisco, per bbl.:			
Grade C fuel oil	$1.00	$1.00	$1.00
Diesel fuel	$1.68	$1.68	$1.68
Stove distillate	$2.10	$2.10	$2.10

Neutral Oils

Western Penna. (Quotations and/or sales prices to car unloaders)

Viscous Neutrals (Viscosity at 70° F.)

200 Vis. (180 at 100°) No. 3 color, 420-425 flash:			
0 pour test	24.50 –25.00	24.00 –24.50	24.00 –24.50
10 pour test	23.50 –24.00	23.00 –23.50	23.00 –23.50
15 pour test	23.00 –23.50	22.50 –23.00	22.50 –23.00
25 pour test	22.00 –22.50	21.50 –22.00	21.50 –22.00
180 Vis. No. 3 color, 410-415 flash:			
25 pour test	20.50 –21.00	20.00 –20.50	20.00 –20.50
150 Vis. No. 3 color, 400-405 flash:			
0 pour test	20.00 –20.50	19.50 –20.00	19.50 –20.00
10 pour test	19.00 –19.50	18.50 –19.00	18.50 –19.00
15 pour test	18.50 –19.00	18.00 –18.50	18.00 –18.50
25 pour test	17.50 –18.00	17.00 –17.50	17.00 –17.50

South Texas (F.o.b. South Texas refineries, for domestic shipment)

Vis. Color			
Pale Oils:	(*Viscosity at* 100° F.; *pour test* 0)		
100 No. 1½-2½	5.00	5.00	5.00
200 No. 2-3	7.00	7.00	7.00
300 No. 2-3	7.50	7.50	7.50
500 No. 2½-3½	8.50	8.50	8.50
750 No. 3-4	9.00	9.00	9.00
1200 No. 3-4	9.50	9.50	9.50
2000 No. 3-4	9.75 –10.00	9.75 –10.00	9.75 –10.00
Red Oils:			
200 No. 5-6	7.00	7.00	7.00
300 No. 5-6	7.50	7.50	7.50
500 No. 5-6	8.50	8.50	8.50
750 No. 5-6	9.00	9.00	9.00
1200 No. 5-6	9.50	9.50	9.50
2000 No. 5-6	9.75 –10.00	9.75 –10.00	9.75 –10.00

Note: South Texas red oil prices shown above cover oils with green cast; blue cast red oils are slightly lower in some cases.

Mid-Continent (Viscosity at 100° F.; F. o. b. Tulsa basis. Prices represent quotations and sales).

0 to 10 Pour Point: Vis. Color			
60-85	5.25	5.25	5.25
86-110	5.75	5.75	5.75
150—No. 3	10.00	10.00	10.00

*Nominal

Neutral Oils (cont'd.)

	Oct. 14	Oct. 7	Sept. 30
150—No. 4	9.50	9.50	9.50
180—No. 3	11.25	11.25	11.25
180—No. 4	10.75	10.75	10.75
180—No. 5	10.25	10.25	10.25
200—No. 3	11.75	11.75	11.75
200—No. 4	11.25	11.25	11.25
200—No. 5	10.75	10.75	10.75
220—No. 3	12.75	12.75	12.75
220—No. 4	12.25	12.25	12.25
220—No. 5	11.75	11.75	11.75
240—No. 3	13.75	13.75	13.75
240—No. 4	13.25	13.25	13.25
240—No. 5	12.75	12.75	12.75
280—No. 3	14.75	14.75	14.75
280—No. 4	14.00	14.00	14.00
280—No. 5	13.50	13.50	13.50
300—No. 3	15.25	15.25	15.25
300—No. 5-6	13.25	13.25	13.25
5 to 30 Pour Point:			
60-85	4.75	4.75	4.75
86-110	5.25	5.25	5.25
50—No. 3	9.00	9.00	9.00
50—No. 4	8.50	8.50	8.50
180—No. 3	10.25	10.25	10.25
180—No. 4	9.75	9.75	9.75
180—No. 5	9.25	9.25	9.25
200—No. 3	10.75	10.75	10.75
200—No. 4	10.25	10.25	10.25
200—No. 5	9.75	9.75	9.75
220—No. 3	11.75	11.75	11.75
220—No. 4	11.25	11.25	11.25
220—No. 5	10.75	10.75	10.75
240—No. 3	12.75	12.75	12.75
240—No. 4	12.25	12.25	12.25
240—No. 5	11.75	11.75	11.75
280—No. 3	13.75	13.75	13.75
280—No. 4	13.00	13.00	13.00
280—No. 5	12.50	12.50	12.50
300—No. 3	14.50	14.50	14.50
300—No. 5-6	13.00	13.00	13.00

Chicago (F.o.b. Chicago refineries) (Vis. at 100° F.)

Pale Oils, *15 to 30 pour point: Vis. Color			
60-85—No. 2	6.50 – 7.00	6.50	6.50
86-110—No. 2	7.00 – 7.50	7.00	7.00
140—No. 3	Discontinued	9.75	9.75
150—No. 3	9.75 -10.25	.....	.....
160—No. 3	Discontinued	10.50	10.50
180—No. 3	11.25 –11.75	11.25	11.25
200—No. 3	11.75 –12.25	11.75	11.75
250—No. 3	13.75 –14.25	13.75	13.75
Red Oils, *15 to 30 Pour Point:			
180—No. 5	10.25 –10.75	10.25	10.25
200—No. 5	10.75 –11.25	10.75	10.75
220—No. 5	Discontinued	11.75	11.75
250—No. 5	12.75 –13.25	12.75	12.75
280—No. 5	13.25 –13.75	13.25	13.25
300—No. 5	13.50 –14.00	13.50	13.50

*Oils with 0 to 10 pour point bring 1c higher than above prices. To obtain prices delivered in Chicago, add 0.25c per gal.

California (F.o.b. California refineries; Viscosity at 100° F.)

All neutral oils, 11.5c per gal. in tank car lots; and 13.5c in iron bbls., to refiners only, excluding federal tax.

Cylinder Stocks

Mid-Continent (F.o.b. Tulsa basis. Prices represent quotations and sales

Bright Stocks:			
190-200 Vis. at 210° D	19.50	19.00	19.00
150-160 Vis. at 210° D:			
0 to 10 pour test	16.50	16.00	16.00
10 to 25 pour test	16.00	15.50	15.50
25 to 40 pour test	15.50	15.00	15.00
150-160 Vis. at 210° E	15.50	15.00	15.00
120 Vis. at 210° D:			
0 to 10 pour test	16.00	15.50	15.50
10 to 25 pour test	15.50	15.00	15.00
25 to 40 pour test	15.00	14.50	14.50
600 Stm. Rfd. Dark Green	5.50 – 6.50	5.50 – 6.50	5.50 – 6.50
600 Stm. Rfd. Olive Green	6.50 – 8.00	6.50 – 8.00	6.50 – 8.00
631 Steam Refined	*10.00	*10.00	*10.00
Black oil	3.25 – 3.375	3.25 – 3.375	3.25 – 3.375

*Only one refiner quoting.

Chicago (F.o.b. Chicago district refineries) (Viscosity at 210°)

Unfiltered Steam Refined:			
140	9.00 – 9.50	9.00	9.00
160	10.00 –10.50	10.00	10.00
200	11.00 –11.50	11.00	11.00
Bright stocks, 160 vis. at 210 No. 8 color:			
0 to 10 pour point	18.25 –18.75	17.75	17.75
15 to 25 pour point	17.75 –18.25	17.25	17.25
30 to 40 pour point	17.25 –17.75	16.75	16.75
E filtered Cyl. Stock	14.00 –14.50	14.00	14.00

(*Continued on page* 107)

REFINERY TANK CAR MARKETS

CONTINUED FROM PAGE 106

Cylinder Stocks (cont'd)

	Oct. 14	Oct. 7	Sept. 30
Western Penna. (A.S.T.M. tests; quotations and/or sales prices to car unloaders)			
600 stm. rfd. filterable	9.50 –10.00	9.50 –10.00	9.50 –10.00
650 steam refined	11.00 –11.50	11.00 –11.50	11.00 –11.50
600 flash	12.00 –12.50	12.00 –12.50	12.00 –12.50
630 flash	17.00 –17.50	17.00 –17.50	17.00 –17.50
600 Warren E	13.00 –13.50	13.00 –13.50	13.00 –13.50
Bright stock, *140-150, vis. at 210°, 540-550 flash, No. 8 color:			
10 pour test	21.50 –22.00	21.00 –21.50	21.00 –21.50
15 pour test	20.50 –21.00	20.00 –20.50	20.00 –20.50
20 pour test	19.50 –20.00	19.00 –19.50	19.00 –19.50
25 pour test	18.50 –19.00	18.00 –18.50	18.00 –18.50

*Incorrectly shown for some time as 150-160.

Petrolatums

Western Penna. (Per pound, in barrels, carload lots, f.o.b. Penna. refinery. In tank cars, 0.5c per pound less. Quotations are from majority of petrolatum makers).

Snow White	6.625	6.625	6.625
Lily White	5.625	5.625	5.625
Cream White	4.625	4.625	4.625
Light Amber	2.75	2.75	2.75
Amber	2.50	2.50	2.50
Red	2.00 – 2.125	2.00 – 2.125	2.00 – 2.125

Wax

Western Penna. (Per pound, f.o.b. New York)

122-124 wh. crude scale, A.m.p.	2.05 – 2.10	2.05 – 2.10	2.05 – 2.10
124-126 wh. crude scale, A.m.p.	2.05 – 2.10	2.05 – 2.10	2.05 – 2.10

Oklahoma (Per pound in barrels; in a few instances, per pound in burlap bags; f.o.b. Oklahoma refineries)

124-126 wh. crude scale. A.m.p.	2.125	2.00 – 2.125	2.00 – 2.125

Chicago (F.o.b. Chicago district refineries, in cents per pound, in bags carload lots. Melting points A.S.T.M. method; add 3° F. to convert into A.m.p.)

Fully refined:			
122-124	4.40 – 4.50	4.40 – 4.50	4.40 – 4.50
125-127	4.65 – 4.75	4.65 – 4.75	4.65 – 4.75
127-129	4.80 – 4.90	4.80 – 4.90	4.80 – 4.90
130-132	*5.20 – 5.30	*5.20 – 5.30	*5.20 – 5.30
132-134	*5.45 – 5.55	*5.45 – 5.55	*5.45 – 5.55
135-137	*6.20 – 6.30	*6.20 – 6.30	*6.20 – 6.30

*Same prices quoted in bags or slabs loose.

*MID-WESTERN TANK CAR MARKETS

Following prices are in cents per gallon, except fuel oil in barrels of 42 U. S. gallons, in tank car lots, representing majority of sales of products made by Chicago sellers, from legally produced crude to jobbers on Group 3 freight basis, although shipments may originate in other South-western or Mid-western refining districts. Prices do not include state or federal taxes.

Gasoline

U. S. Motor gasoline:	Oct. 14	Oct. 7	Sept. 30
62 octane and below (3rd grade)	4.625– 4.75	4.625– 4.75	4.75
63-70 octane (regular)	5.50 – 5.75	5.50 – 5.75	5.50 – 5.75
71 octane and above	.....	.....	.....
60-62, 400 e.p.	4.75 – 4.875	4.75 – 4.875	4.75 – 4.875
64-66, 375 e.p.	4.875– 5.00	4.875– 5.00	4.875– 5.00
68-70, 350-360 e.p.	5.00 – 5.125	5.00 – 5.125	5.00 – 5.125

Kerosine

41-43 w.w.	3.25 – 3.375	3.25 – 3.375	3.25 – 3.375
42-44 w.w.	3.375– 3.50	3.375– 3.50	3.375– 3.50

Fuel *and* Gas Oils

Domestic:			
No. 1 prime white	3.125– 3.25	3.125– 3.25	3.125– 3.25
No. 1 straw	3.00 – 3.25	3.00 – 3.25	3.00 – 3.25

*Formerly Chicago Tank Car Markets.

	Oct. 14	Oct. 7	Sept. 30
No. 2 straw	2.875– 3.00	2.875– 3.00	2.875– 3.00
No. 2 dark	2.75 – 2.875	2.75 – 2.875	2.75 – 2.875
No. 3	2.625– 2.75	2.625– 2.75	2.625– 2.75
No. 4 (per bbl.)	$0.85 –$0.90	$0.85 –$0.90	$0.85 –$0.90
No. 5 (per bbl.)	$0.625–$0.65	$0.625–$0.65	$0.625–$0.65
Industrial:			
No. 4, (per bbl.)	$0.75 –$0.80	$0.75 –$0.80	$0.75 –$0.80
No. 5, (per bbl.)	$0.575–$0.60	$0.575–$0.60	$0.575–$0.60
No. 6, (per bbl.)	$0.45 –$0.50	$0.45 –$0.50	$0.45 –$0.50
U.G.I. gas oil	2.25 – 2.375	2.25 – 2.375	2.25 – 2.375

Naphtha *and* Solvent

Stoddard solvent	6.375	6.375	6.375
V. M. & P. naphtha	6.875	6.875	6.875
Cleaners' naphtha	6.875	6.875	6.875
Mineral spirits	5.875	5.875	5.875
Rubber solvent	6.875	6.875	6.875
Lacquer diluent	7.875	7.875	7.875

DAILY GASOLINE PRICES

Daily range of gasoline prices (cents per gallon) in tank cars, as reported in PLATT'S OILGRAM, (Week Ended Oct. 11, 1935)

	Oct. 7	Oct. 8	Oct. 9	Oct. 10	Oct. 11
U. S. Motor, 62 octane & below (3rd grade);					
East Texas	4.625	4.625	4.625	4.625	4.625– 4.75
*North Texas	4.75	4.75	4.75	4.75	4.75
West Texas	4.75 – 4.875	4.75 – 4.875	4.75 – 4.875	4.75 – 4.875	4.75 – 4.875
Oklahoma	4.75 – 4.875	4.75 – 4.875	4.75 – 4.875	4.75 – 4.875	4.75 – 4.875
Mid-Western (Group 3 basis)	4.625– 4.75	4.625– 4.75	4.625– 4.75	4.625– 4.75	4.625– 4.75
U. S. Motor, 63-70 octane (regular):					
East Texas	.....	.....	.....	.....	.....
*North Texas	5.625	5.625	5.625	5.625	5.625
West Texas	5.625– 5.75	5.625– 5.75	5.625– 5.75	5.625– 5.75	5.625– 5.75
Oklahoma	5.625– 5.75	5.625– 5.75	5.625– 5.75	5.625– 5.75	5.625– 5.75
Mid-Western (Group 3 basis)	5.50 – 5.75	5.50 – 5.75	5.50 – 5.75	5.50 – 5.75	5.50 – 5.75
Motor Gasoline, 60-64 octane					
New York harbor	6.00	6.00	6.00	6.00	6.00
Philadelphia district	6.00	6.00	6.00	6.00	6.00
Baltimore district	6.00	6.00	6.00	6.00	6.00
Motor Gasoline, 65 octane & above					
New York harbor	6.25	6.25	6.25	6.25	6.25
Philadelphia district	6.25	6.25	6.25	6.25	6.25
Baltimore district	6.25	6.25	6.25	6.25	6.25
U. S. Motor Gasoline					
Bradford-Warren (Western Penna.)	5.125– 5.25	5.125– 5.25	5.125– 5.25	5.125– 5.25	5.125– 5.25
Other districts (Western Penna.)	5.125– 5.25	5.125– 5.25	5.125– 5.25	5.125– 5.25	5.125– 5.25
Motor Gasoline, Minimum 60 octane					
Bradford-Warren (Western Penna.)	6.50 – 6.625	6.50 – 6.625	6.50 – 6.625	6.50 – 6.625	6.50 – 6.625
Other districts (Western Penna.)	6.50 – 6.625	6.50 – 6.625	6.50 – 6.625	6.50 – 6.625	6.50 – 6.625
Motor Gasoline, Minimum 65 octane					
Bradford-Warren (Western Penna.)	6.75 – 6.875	6.75 – 6.875	6.75 – 6.875	6.75 – 6.875	6.75 – 6.875
Other districts (Western Penna.)	6.75 – 6.875	6.75 – 6.875	6.75 – 6.875	6.75 – 6.875	6.75 – 6.875

*For shipment to Texas and New Mexico destinations; Group 3 prices are quoted on northern shipments.

TANK WAGON, SERVICE STATION MARKETS

Tax column includes 1c federal tax, state gasoline tax, also city and county taxes as indicated in footnotes, and inspection fees, as shown in general footnote. These prices in effect Oct. 14, 1935, as posted by principal marketing companies at their headquarters offices, but subject to later corrections.

S. O. New Jersey

Essolene

	Consumer Tank Car	Dealer T.W.	Taxes	Posted S.S.	Kerosine T.W.
Atlantic City, N. J.	7	9.5	4	17	9
Newark, N. J.	7	9.5	4	17	7.5
Annapolis, Md.	7.3	9.8	5	18.3	10
Baltimore, Md.	6.8	9.3	5	17.8	7.5
Cumberland, Md.	8.3	10.8	5	19.3	12.7
Washington, D. C.	6.8	9.3	3	15.8	9
Danville, Va.	8.1	10.6	6	20.1	12.9
Norfolk, Va.	6.6	9.1	6	18.6	11.3
Petersburg, Va.	7.3	9.8	6	19.3	11.7
Richmond, Va.	7.3	9.8	6	19.3	11.7
Roanoke, Va.	8.3	10.8	6	20.3	12.9
Charleston, W. Va.	7.5	10	5	18.5	12.6
Parkersburg, W. Va.	6.8	9.3	5	17.8	11.2
Wheeling, W. Va.	8	10.5	5	19	12.2
Charlotte, N. C.	8.4	10.9	7	21.4	12.9
Hickory, N. C.	8.7	11.2	7	21.7	13.1
Mt. Airy, N. C.	8.7	11.2	7	21.7	13.2
Raleigh, N. C.	8.1	10.6	7	21.1	12.7
Salisbury, N. C.	8.5	11	7	21.5	13
Charleston, S. C.	6.7	9.2	7	19.7	11.3
Columbia, S. C.	8	10.5	7	21	12.6
Spartanburg, S. C.	8.4	10.9	7	21.4	12.9

Price basis to undivided dealers: Dealer t.w. price less 0.5c per gal.

Price basis to commercial consumers: Beginning Feb. 11, 1935, all new commercial consumers will be signed on following differentials over tank car price, on yearly purchases: up to 35,999 gals., 2.5c over t.c.; 36,000 to 119,999 gals., 2c; 120,000 to 239,999 gals., 1.5c; 240,000 to 479,999 gals., 1c; and over 480,000 gals., 0.5c.

Above prices apply only when deliveries are made in lots of 50 or 100 gals. at one time, depending on code region in which deliveries are effected.

If deliveries are made in less than these minimum quantities, s.s. price at time and place of delivery applies.

Non-contract customers will be billed at 2.5c over tank car price at time and place of delivery.

Kerosine Discount: 1c off t.w. price for 25 gals. or more, under contract thru territory (Baltimore City contract not necessary) except no discount in state of New Jersey.

Socony-Vacuum Oil Co., Inc.

(S. O. New York Division)

Socony Mobilgas

	"Split" Dealer T.W.	Taxes	Total "Split" Dealer T.W.	S.S.	Kerosine T.W
Metropolitan N. Y. City					
	10.05	*5	15.05	*19.3	7
Staten Island	9.55	*5	14.55	*18.3	7.25
Brooklyn	9.8	*5	14.8	*18.8	7
Albany, N. Y.	9.2	5	14.2	17.7	7.5
Binghamton, N. Y.	9.5	5	14.5	18	8.75
Buffalo, N. Y.	7	5	12	14	8
Jamestown, N. Y.	9.8	5	14.8	18.3	8
Plattsburg, N. Y.	10.2	5	15.2	18.7	8.5
Rochester, N. Y.	8	5	13	16	8
Syracuse, N. Y.	8.5	5	13.5	16	8.5
Danbury, Conn.	9.35	4	13.35	16.5	7.5
Hartford, Conn.	9.3	4	13.3	16.8	6.75
New Haven, Conn.	9.2	4	13.2	16.7	6.75
Bangor, Me.	10	5	15	18.5	8.5
Portland, Me.	9.5	5	14.5	18	7.5
Boston, Mass.	9	4	13	16.5	7
Concord, N. H.	10.2	5	15.2	18.7	8.25
Lancaster, N. H.	11.2	5	16.2	20	9.25
Manchester, N. H.	9.8	5	14.8	18.3	7.75
Providence, R. I.	8	3	11	13.5	7
Burlington, Vt.	11.2	5	16.2	19.7	8.5
Rutland, Vt.	11.1	5	16.1	19.6	9

*Plus 2% city sales tax computed at time of each sale.

Discounts to dealers: thru territory, except New York City, off normal s.s. price, 4c to undivided dealers, and 3.5c to "split" dealers. In metropolitan New York City, to undivided dealers, 4.75c; in Brooklyn, 4.5c; in Staten Island, 4.25c. Split dealers receive 0.5c less margin than undivided dealers.

To commercial consumers: Effective Feb. 4, 1935, covering yearly purchases, billed at posted tank car price, plus these differentials: 2.5c for delivery of 1,200 to 36,000 gals.; plus 2c, for 36,000 to 120,000 gals.; plus 1.5c for 120,000 to 240,000 gals.; plus 1c for 240,000 to 480,000 gals.; plus 0.5c for 480,000 gals. and over. Those buying less than 1,200 gals. yearly, get retail s.s. price.

Atlantic Refining

Atlantic White Flash Plus Gasoline

	T.W.	Taxes	Total T.W.	S.S.	Kerosine T.W.
Philadelphia, Pa.	11	5	16	18	9
Pittsburgh, Pa.	12	5	17	19	10
Allentown, Pa.	11.5	5	16.5	18.5	9
Erie, Pa.	11	5	16	18	8
Scranton, Pa.	11	5	16	16	10
Altoona, Pa.	12	5	17	19	10
Dover, Del.	11.5	5	16.5	18.5	10
Wilmington, Del.	11.5	5	16.5	17.5	9
Boston, Mass.	9	4	13	16.5	7
Springfield, Mass.	9.2	4	13.2	16.7	7.5
Worcester, Mass.	9.3	4	13.3	16.8	7.5
Fall River, Mass.	9.2	4	13.2	13.5	7.5
Providence, R. I.	9	3	12	13.5	7
Hartford, Conn.	9.3	3	12.3	15.8	7
New Haven, Conn.	9.2	3	12.2	15.7	7.5
Atlantic City, N. J.	9.5	4	13.5	17	9
Camden, N. J.	9.5	4	13.5	17	8.5
Trenton, N. J.	9.5	4	13.5	17	8
Annapolis, Md.	9.8	5	14.8	18.3	9.5
Baltimore, Md.	9.3	5	14.3	17.8	7.5
Hagerstown, Md.	10.3	5	15.3	18.8	10
Richmond, Va.	9.8	6	15.8	19.3	11.7
Wilmington, N. C.	9.3	7	16.3	19.8	11.4
Brunswick, Ga.	11	7	18	20	*14
Jacksonville, Fla.	10.5	8	18.5	20.5	10

Dealer discounts: on Atlantic White Flash Plus gasoline, thru territory, divided dealers, price equal to 3.5c off posted s.s. price; undivided dealers, price equal to 4c off posted s.s. price; authorized dealers contracts previous to Aug. 19, 1933, price equal to 3c less than posted s.s. price, plus 1c rental

Discounts to commercial consumers: Consumer t.w. accounts billed at full t.w. price, with these discounts, effective Dec. 4, 1934, on yearly purchases: 1800 to 36,000 gals., 1.5c; 36,000 to 120,000 gals., 2c; 120,000 to 240,000 gals., 3c; 240,000 to 480,000 gals., 3.25c; 480,000 gals. and over, 3.5c. Those buying less than 100 gals. get retail s.s. price.

*Georgia kerosine has 1c state tax, not included in above prices.

S. O. Ohio

Sohio X-70 Gasoline

Ohio statewide	12	5	17	19	*12.5

Renown (Third Grade Gasoline)

Ohio statewide	11.5	5	16.5	17.5	....

Counties off statewide gasoline schedule:
Butler, Champaign, Clark, Darke, Franklin, Greene, Hamilton, Miami, Montgomery, Preble and Summit. . . . . 12 5 17 19 ....

Statewide Prices to Resellers & Agents

(On sliding scale basis, reflecting tank car price of 8.625 per gal. for 65-70 octane).

	†Undivided Accounts	Divided Accounts	**Authorized Agents
Including taxes			
Sohio X-70	15.5	16	16
Renown (3rd grade)	15	15.5	15.5

Note: On single deliveries of motor gasolines under 25 gallons, to t.w. consumers, s.s. price applies.

Sales tax: Ohio's 3% sales tax, effective Jan. 27, 1935, is added "where assessable, to regular posted prices", S. O. Ohio says.

*Kerosine prices include 1c state tax. Kerosine t.w. price in Hardin and Wyandot counties is 11.5c.

†Excluding authorized agents.

**Excluding 0.5c rental.

Discounts to contract tank wagon consumers only: on all motor gasolines, effective Dec. 1, 1934, off t.w. price, on deliveries per month: 1,000 to 9,999 gals., 1.5c per gal. 10,000 gals. and over, 2.5c. Under 1,000 gals., full t.w. price. Single deliveries of less than 25 gals., full s.s. price.

Discounts on kerosine: to dealers and commercial consumers, 3c per gal. off t.w. price, any quantity.

S. O. Kentucky

Crown Gasoline

	T.W.	Taxes	Total T.W.	S.S.	Kerosine T.W.
Lexington, Ky.	13.5	6	19.5	21.5	10
Louisville, Ky.	12.5	6	18.5	20.5	10
Paducah, Ky.	12.5	6	18.5	20.5	10
Covington, Ky.	12	6	18	20	11.5
Jackson, Miss.	12	7	19	21	*11
Vicksburg, Miss.	12	7	19	21	*12
Birmingham, Ala.	13	*8	21	23	12
Mobile, Ala.	11	*8	19	21	11
Montgomery, Ala.	13	*9	22	24	*13.5
Macon, Ga.	13	7	20	22	*13
Atlanta, Ga.	13	7	20	22	*12
Augusta, Ga.	13	7	20	22	*13
Savannah, Ga.	11	7	18	20	*14
Jacksonville, Fla.	10.5	8	18.5	20.5	10
Miami, Fla.	10.5	8	18.5	20.5	13.5
Tampa, Fla.	10.5	8	18.5	20.5	11
Pensacola, Fla.	10	*9	19	20	11.5

Kyso (Third Grade)

Lexington, Ky.	12.5	6	18.5	20	....
Louisville, Ky.	10.5	6	16.5	17.5	....
Paducah, Ky.	10	6	16	16.5	....
Covington, Ky.	10.5	6	16.5	18.5	....
Jackson, Miss.	11	7	18	19.5	....
Vicksburg, Miss.	10	7	17	18	....
Birmingham, Ala.	11	*8	19	20	....
Mobile, Ala.	9	*8	17	18	....
Montgomery, Ala.	11	*9	20	21	....
Atlanta, Ga.	9	7	16	17	....
Augusta, Ga.	9.5	7	16.5	17	....
Macon, Ga.	9.5	7	16.5	17	....
Pensacola, Fla.	7.5	*9	16.5	17	....

Dealer Discount: off posted s.s. price, on Crown and Crown Ethyl gasolines to "undivided" dealers 4c; on Kyso, 3c. To "divided" dealers: Crown and Ethyl, 3.5c, and Kyso, 2.5c, all effective on or about Jan. 1, 1934.

Discounts to tank wagon consumers: all single deliveries of 25 gals. or less, get posted s.s. price: all single deliveries of 25 gals. or more, to be billed at posted t.w. price, plus following discounts, off posted t.w. price: Ethyl and Crown gasoline, 25 to 2,999 gals. monthly, 1.5c; Kyso, 1c; 3,000 to 24,999 gals., Ethyl and Crown, 2c; Kyso, 1.5c; 25,000 gals. or more, Ethyl and Crown, 3c; and Kyso, 2.5c.

**Taxes*: in the tax column is included these city and county gasoline taxes at the following points: Birmingham, 1c city; Mobile, 1c city; Montgomery, 1c city and 1c county; Pensacola, 1c city. Georgia and Mississippi kerosine prices include 1c state tax Montgomery kerosine price includes ⅝c city tax.

S. O. Indiana

Standard Red Crown Gasoline

Chicago, Ill.	11.5	4	15.5	16	9.8
Decatur, Ill.	11.5	4	15.5	17.5	9.8
Joliet, Ill.	11.5	4	15.5	17.5	9.8
Peoria, Ill.	11.5	4	15.5	15.5	9.8
Quincy, Ill.	11.3	4	15.3	17.3	9.6
Indianapolis, Ind.	12.4	*5	17.4	19.4	‡14.5
Evansville, Ind.	12.2	*5	17.2	19.2	‡14.3
South Bend, Ind.	12.6	*5	17.6	19.6	‡12
Detroit, Mich.	10.5	4	14.5	15.5	9.3
Grand Rapids, Mich.	12.6	4	16.6	17.6	10.5
Saginaw, Mich.	12.8	4	16.8	18.8	9.3
Green Bay, Wisc.	12.2	5	17.2	19.2	10.5
Milwaukee, Wisc.	10.3	5	15.3	16.8	10.1
La Crosse, Wisc.	11.9	5	16.9	18.9	10.2
Minneapolis, Minn.	12.9	4	16.9	17.9	10.2
Duluth, Minn.	12.3	4	16.3	18.3	10.6
Mankato, Minn.	11.9	4	15.9	17.9	10.2
Des Moines, Iowa	11.3	4	15.3**	18.3	9.6
Sioux City, Iowa	11.5	4	15.5**	17.5	9.8
Davenport, Iowa	11.5	4	15.5**	17.5	9.8
Mason City, Iowa	11.7	4	15.7**	17.7	10
St. Louis, Mo.	11.2	†4	15.2	17.2	9.5
Kansas City, Mo.	10.9	†4	14.9	14.9	9.2
St. Joseph, Mo.	10.9	†4	14.9	16.9	9.2
Fargo, N. D.	12.9	4	16.9	18.9	11.2
Minot, N. Dak.	14.1	4	18.1	20.1	12.4
Huron, S. Dak.	12.4	*5	17.4	19.4	10.7
Wichita, Kans.	10.4	4	14.4	16.4	6.3

Note: Kerosine s.s. prices are generally 3c above normal t.w. price.

Above prices include these inspection fees on both gasoline and kerosine, per gallon, figured on basis of 50 gallons per barrel:

Alabama, 1/40c on gasoline, 1/2c on kerosine; Arkansas, 1/5c per gal. in a single barrel, 1/20c per gal. in bulk; Florida, 1/8c; Illinois, 3/100c; Indiana, 1/2c per gal. in a single barrel; 3/10c per gal. in lots of 2 to 10 bbls., 1/5c for 10 to 50 bbls., 2/25c for over 50 bbls.; Kansas, 1/50c, (3/50c can be charged to meet inspection department expenses); Louisiana, 1/32c; Minnesota, 1/25c; Missouri, 3/100c; Nebraska, 3/100c; Nevada, gasoline, 1/20c; North Carolina, 1/4c; North Dakota, 1/20c; Oklahoma, 2/25c per gal. in lots of more than 50 bbls., 1/5c in lots less than 50 bbls.; South Carolina, 1/8c; South Dakota, 1/10c; Tennessee 2/5c; and Wisconsin, 1/25c.

Kerosine inspection fee only: Iowa, 2/25c; Michigan, 4/5c per gal. for first 2 bbls.; 3/5c for next 3; 2/5c for next 5; 3/10c for next 15, and 1/5c per gal. in lots over 25 bbls.

TANK WAGON, SERVICE STATION MARKETS

Tax column includes 1c federal tax, state gasoline tax, also city and county taxes as indicated in footnotes, and inspection fees, as shown in general footnote. These prices in effect Oct. 14, 1935, as posted by principal marketing companies at their headquarters offices, but subject to later corrections.

S. O. Indiana (Cont'd)

Stanolind Gasoline (Third Grade)

Stanolind normal prices are 1c under normal Red Crown prices, thru territory. Among subnormal points are the following:

	T.W.	Total Taxes	T.W.	S.S.	Kerosine T.W.
Decatur, Ill.	10.5	4	14.5	16	....
Peoria, Ill.	10.5	4	14.5	14.3	....
Evansville, Ind.	11.2	*5	16.2	17.7	....
Indianapolis, Ind.	11.4	*5	16.4	18.1	....
Des Moines, Iowa	8.6	4	12.6**	17.3	....
Detroit, Mich.	9	4	13	14	....
Grand Rapids, Mich.	11.2	4	15.2	16.2	....
Milwaukee, Wis.	9.3	5	14.3	15.8	....
Huron, S. D.	11.4	*5	16.4	18.4	....
Wichita, Kans.	7.5	4	11.5	13.9	....

†St. Louis, Kansas City and St. Joseph prices include 1c city tax. ‡Includes 4c state tax.

*South Dakota gasoline and kerosine prices include 0.1c for sales tax. Indiana t.w. and s.s. gasoline prices include 0.2c for chain store tax.

**Service station prices for gasoline at Iowa points represent the opinion of National Petroleum News as to prices prevailing at the majority of stations.

Discounts to dealers: Effective Dec. 1, 1934, thru territory except Michigan, effective Apr. 1, 1935, and except Chicago division and Iowa, maximum discounts to controlled and uncontrolled dealers and undivided gasoline accounts, off s.s. price at normal points: Ethyl and Red Crown gasoline, 3.5c; Stanolind 2.5c; in Chicago, Ethyl and Red Crown, 4c; Stanolind, 3c; at points where prices are more than 1c subnormal, 0.5c less. Divided gasoline accounts get 0.5c less per gallon. In case of lease and agency and AAA accounts, the above discounts include the 0.5c per gal. rental allowance. In Iowa, normal dealer prices are 1.5c below normal t.w. price for first and second grade gasolines, and 0.5c under normal t.w. for third grade.

Discounts to commercial consumers: effective Jan. 1, 1935, thru territory, except Michigan effective Feb. 1, on purchases per month, discount off t.w. price; all gasolines, 25 to 1,000 gals., at t.w. price; 1,000 gals. or more, 1.5c off t.w. on Ethyl and Red Crown, and 0.5c on Stanolind. Purchases of less than 25 gals. get regular s.s. price.

S. O. Nebraska

Standard Red Crown Gasoline

Omaha, Neb.	11.9	5	16.9	18.9	10.1
McCook, Neb.	12.6	5	17.6	19.6	10.8
Norfolk, Neb.	12.3	5	17.3	19.3	10.5
North Platte, Neb.	12.7	5	17.7	19.7	10.9
Scottsbluff, Neb.	13.4	5	18.4	20.4	11.6

Reliance Gasoline (Third Grade)

Omaha, Neb.	10.5	5	15.5	15.5	....
McCook, Neb.	11.1	5	16.1	18.1	....
Norfolk, Neb.	11.3	5	16.3	18.3	....
North Platte, Neb.	11.7	5	16.7	18.7	....
Scottsbluff, Neb.	12.4	5	17.4	19.4	....

Discount to dealers: where service station gasoline prices are normal, resellers' allowance off service station prices are (*Maximum* over-all, including rent) as follows: Reliance, 2½c; Standard Red Crown, and Red Crown Ethyl, 3½c. Where service station gasoline prices are below normal, resellers' allowances are reduced one-half of the amount below normal, down to the following (*Minimum* over-all including rent): Reliance, 2c, Standard Red Crown and Red Crown Ethyl 3c.

Discounts to consumers: for tank wagon deliveries covered only by Standard Commercial Consumer Contract, effective January 1, 1935.

S. O. Louisiana

Essolene

	Consumer Tank Car	Dealer T.W.	Taxes	Posted S.S.	Kerosine T.W.
Little Rock, Ark.	7	9.5	7.5	20.5	11.5
Alexandria, La.	7	9.5	*8	21	*10.5
Baton Rouge, La.	7	9.5	*7	20	*11.5
New Orleans, La.	7	9.5	*8	21	*12
Lake Charles, La.	7.5	10	*8	21.5	*11
Shreveport, La.	6.5	9	*7	19.5	*9
Lafayette, La.	7.5	10	*8	21.5	*12.5
Bristol, Tenn.	8.6	9.85	8	20.6	14.5
Chattanooga, Tenn.	9	11.5	8	23	11.5
Knoxville, Tenn.	9.5	12	8	23.5	14
Memphis, Tenn.	7.5	10	8	21.5	9.5
Nashville, Tenn.	8.5	11	8	22.5	12

*Baton Rouge and Shreveport gasoline tax includes 5c state tax, 1c federal tax, and 1c parish tax. Alexandria, Lake Charles, Lafayette and New Orleans, 2c parish tax. Louisiana kerosine prices include 1c state tax; New Orleans kerosine includes also 1c parish tax.

Price basis to dealers: Undivided dealers get dealer price, less 0.5c.

Price basis to commercial consumers: Effective Feb. 11, 1935, commercial consumers not under contract will be billed at 2.5c per gal. above posted bulk plant tank car price at time and place of delivery in lots of 50 gals. or more at one time. Contract customers will be billed at following differentials over tank car price, on yearly purchases: up to 35,999 gals., 2.5c over tank car price; 36,000 to 119,999 gals., 2c over; 120,000 to 239,999 gals. 1.5c; 240,000 to 479,999 gals., 1c; 480,000 gals. and over, 0.5c.

On single deliveries to all classes of commercial consumers, of less than 50 gals., s.s. price at time and place of delivery applies.

Magnolia Petroleum

Mobilgas

	T.W.	Total Taxes	T.W.	S.S.	Kerosine T.W.
Muskogee, Okla.	11	5	16	18	8
Oklahoma City	11	5	16	18	8
Tulsa, Okla.	11	5	16	18	8
Fort Smith, Ark.	9.5	†5	14.5	18	8
Little Rock, Ark.	9.5	7.5	17	20.5	9.5
Texarkana, Ark.	10.5	*5	15.5	17.5	8
Dallas, Tex.	10	5	15	17	7
Ft. Worth, Tex.	10	5	15	17	7
Houston, Tex.	11	5	16	18	8
San Antonio, Tex.	11	5	16	18	8
El Paso, Tex.	12	5	17	19	10
Santa Fe, N. M.	13.5	**7	20.5	22.5	12
Roswell, N. M.	12.5	††6.5	19	21	10

Metro Gasoline (Third Grade)

Muskogee, Okla.	8	5	13	15	....
Oklahoma City	9	5	14	16	....
Tulsa, Okla.	9	5	14	16	....
Fort Smith, Ark.	9	5	14	16.5	....
Little Rock, Ark.	9	7.5	16.5	15	....
Texarkana, Ark.	7.5	5	12.5	14.5	....
Dallas, Tex.	7	5	12	14	....
Ft. Worth, Tex.	7	5	12	14	....
Houston, Tex.	8	5	13	15	....
San Antonio, Tex.	9	5	14	16	....
El Paso, Tex.	10	5	15	17	....
Santa Fe, N. M.	11.5	**7	18.5	20.5	....
Roswell, N. M.	10.5	††6.5	17	19	....

*In Texarkana, 4c Texas tax applies; outside Texarkana, 6.5c Arkansas tax applies.

†In Fort Smith, 4c Oklahoma tax applies outside Fort Smith, 6.5c Arkansas tax applies.

**Includes 1c city tax.

††Includes 0.5c city tax.

Note: *Price basis to dealers* off s.s. price in t.w., bulk or bbl. deliveries, on Mobilgas and Ethyl, normally: to 100% dealers, 4c; to divided dealers, 3.5c. On Metro gasoline in Texas, Oklahoma and New Mexico: to 100% dealers, 3c; to divided dealers 2.5c. On Metro, in Arkansas and Louisiana: to 100% dealers 3c.

Price basis to consumers: thru Texas, Oklahoma and New Mexico, except federal and state governments and political sub-divisions thereof; and also drainage, navigation and reclamation districts and road contractor accounts in Texas (in Texas all foregoing accounts receive same graduated discounts allowed 100% dealers, on all grades of gasoline, which see in above paragraph). All grades of gasoline invoiced at consumer's t.w. price, which normally is 2c less than s.s. price, less following contract quantity discounts at end of month, on monthly purchases: 3,001 to 10,000 gals., Mobilgas and Ethyl, 1c, Metro, 0.5c; 10,001 gals. and over, Mobilgas and Ethyl, 2c, Metro, 1c; 25 to 3,000 gals., no discount. Thru Arkansas and Louisiana, all grades gasoline invoiced at consumer's t.w. price, which normally is 3.5c on Mobilgas and Ethyl, and 3c on Metro less than s.s. price, less following contract quantity discounts at end of month, on all three grades, on monthly purchases: 3,001 to 10,000 gals., 0.5c; 10,001 to 20,000 gals., 1c; 20,001 to 40,000 gals., 1.5c; and 40,001 gals. and over, 2c.

Continental Oil

Conoco Bronze Gasoline

Denver, Colo.	13	5	18	20	11
Pueblo, Colo.	13	5	18	20	13
Grand Junc., Colo.	15.5	5	20.5	22.5	15
Casper, Wyo.	13.5	5	18.5	20.5	11.5
Cheyenne, Wyo.	13.5	5	18.5	20.5	13
Billings, Mont.	13.5	6	19.5	21.5	16.5
Butte, Mont.	15	6	21	23	17.5
Great Falls, Mont.	14.5	6	20.5	22.5	17.5
Helena, Mont.	15.5	6	21.5	23.5	17.5
Salt Lake City, Utah.	13	5	18	20	16
Boise, Ida.	16.5	6	22.5	24.5	18
Twin Falls, Ida.	17	6	23	25	18
Albuquerque, N. M.	13.5	†6.5	20	22	13

Continental Oil (Cont'd)

Demand (Third Grade)

	T.W.	Total Taxes	T.W.	S.S.	Kerosine T.W.
Denver, Colo.	11	5	16	18	....
Cheyenne, Wyo.	11.5	5	16.5	18.5	....
Helena, Mont.	13.5	6	19.5	21.5	....
Salt Lake City, Utah.	10	5	15	17	....
Boise, Ida.	14.5	6	20.5	22.5	....
Albuquerque, N. M.	11.5	†6.5	18	20	....

†Includes city tax of 0.5c.

Discounts: effective March 1, 1934, on gasolines, thru territory, off s.s. price: to "undivided" dealers: Ethyl and Conoco Bronze, 4c; Demand, 3c; to "divided" dealers: Ethyl and Conoco Bronze, 3.5c; Demand, 2.5c.

S. O. California

Standard Gasoline

San Francisco, Cal.	8.5	4	12.5	14.5	11.5
Los Angeles, Cal.	5.5	4	9.5	11.5	10.5
Fresno, Cal.	9	4	13	15	12
Phoenix, Ariz.	9	6	15	17	†16
Reno, Nev.	11.5	5	16.5	18.5	13
Portland, Ore.	10.5	6	16.5	18.5	13.5
Seattle, Wash.	10.5	6	16.5	18.5	13.5
Spokane, Wash.	13.5	6	19.5	21.5	16.5
Tacoma, Wash.	10.5	6	16.5	18.5	13.5

Flight Gasoline (Third Grade)

San Francisco, Cal.	7	4	11	13	....
Los Angeles, Cal.	4.5	4	8.5	10.5	....
Fresno, Cal.	8	4	12	14	....
Reno, Nev.	10	5	15	17	....
Phoenix, Ariz.	8	6	14	16	....
Portland, Ore.	9	6	15	17	....
Seattle, Wash.	9	6	15	17	....
Spokane, Wash.	12	6	18	20	....
Tacoma, Wash.	9	6	15	17	....

††Includes 5c state tax.

Discounts: on gasoline: on Stanavo Aviation, Standard Ethyl, and Standard gasolines, to 100% dealers, 2c below t.w. price; on Flight, 1c per gal. below t.w. To "split" dealers, all brands gasoline 1c below t.w.

Effective September 24, 1935, to commercial consumers: advance quantity discount from above prices extended at time of delivery, on Stanavo Aviation, Standard Ethyl and Standard gasolines, 2c per gal.; Flight, 1c.

On kerosine: tank car delivery, 3.5c off t.w. price to all classes of trade; transport truck and trailer deliveries, 3.5c below t.w. to resellers; plant deliveries to jobbers, 3c below t.w.

Canada

Prices of Imperial Oil Ltd.

Per Imperial Gallon, which is 1.2 U. S. Gallons

Imperial Three Star Gasoline

Hamilton, Ont.	15	6	21	23.5	16.5
Toronto, Ont.	15	6	21	23.5	16.5
Brandon, Man.	23.3	7	30.3	33.3	21.8
Winnipeg, Man.	21.7	7	28.7	31.7	20.2
Regina, Sask.	23	7	30	33	21.5
Saskatoon, Sask.	25.8	7	32.8	35.8	24.3
Edmonton, Alta.	25.2	7	32.2	35.2	23.7
Calgary, Alta.	22.5	7	29.5	32.5	21
Vancouver, B. C.	17.5	7	24.5	27.5	24
Montreal, Que.	14.5	6	20.5	23	17
St. John, N. B.	18	8	26	30	19.5
Halifax, N. S.	18	8	26	30	19.5

Discount to dealers and A.R.D. Accounts:

On gasoline, effective May 14, 1934: in Maritime Provinces, all dealers get 4c off s.s. price; in all other provinces, open dealers get 3c off s.s. price and 1c additional to 100% accounts, except Montreal City, Hamilton and Toronto, where open dealers get 2.5c off s.s. price with 1c additional to 100% accounts.

Aviation Gasoline

Following are tank car and/or tank wagon prices of aviation gasoline in principal marketing territories (Stanavo aviation in all territories except Continental Oil and Magnolia Pet. Co.) Tax column includes 1c federal tax, and state tax; also municipal taxes as indicated in footnotes.

Effective Oct. 14, 1935

S. O. New Jersey

	Tank Car	T.W.
Bayonne, N. J.	9.5	12
Baltimore, Md.	9.5	12
Washington, D. C.	....	12.6
Richmond, Va.	....	13.5
Greensboro, N. C.	....	14.9
Raleigh, N. C.	....	14.6
Charleston, W. Va.	....	14.2

TANK WAGON, SERVICE STATION MARKETS

Tax column includes 1c federal tax, state gasoline tax, also city and county taxes as indicated in footnotes, and inspection fees, as shown in general footnote. These prices in effect Oct. 14, 1935, as posted by principal marketing companies at their headquarters offices, but subject to later corrections.

Colonial Beacon Oil Co.

	Tank Car
Brooklyn, N. Y.	12.8
Buffalo, N. Y.	13.7
Boston, Mass.	13.5

S. O. Pennsylvania

Philadelphia, Pa.	14.1
Pittsburgh, Pa.	14.9

S. O. Louisiana

F.O.B. Tulsa	8.5

Prices in above four territories do not include state or federal taxes. They are for 73 octane grade aviation gasoline. An 80 octane product generally brings 0.5c premium and an 87 octane product, 1.5c premium over the 73 octane grade.

Note: S.s. prices in above four territories are generally 6c over t.w. prices. Following discounts apply for t.w. deliveries, on monthly purchases, off t.w. price: 3,000 to 10,000 gals., 0.5c; 10,000 to 20,000 gals., 1c; 20,000 to 40,000 gals., 1.5c; and over 40,000 gals., 2c. Consumer t.w. price is generally tank car price, plus freight, plus 2.5c per gal.

S. O. Ohio

	T.W.	Tax	Total T.W.
Thru Ohio: (To Commercial Consumers) Stanavo Ethyl Aviation (73 Octane):	15.5	5	20.5

Discounts: For delivery on contract to hangar operators and resellers: 2c below commercial consumer posted t.w. price.

S. O. Indiana

Chicago, Ill.	14.5	4	18.5
Indianapolis, Ind.	15.4	5	20.4
Detroit, Mich.	15.7	4	19.7
Milwaukee, Wisc.	14.8	5	19.8
Minneapolis, Minn.	14.9	4	18.9
St. Louis, Mo.	13.2	*4	17.2
Kansas City, Mo.	13.9	*4	17.9
Fargo, N. D.	15.9	4	19.9
Huron, S. D.	**15.4	5	20.4
Wichita, Kans.	13.4	4	17.4

*Includes 1c city tax.
**Includes 0.1c to cover sales tax.

Magnolia Petroleum

Dallas, Tex.	13	5	18

Humble Oil & Refining Co.

	Tank Car
Baytown, Tex. (exclusive of taxes)	8.2

Continental Oil Co.

	T.W.	Tax	Total T.W.
Denver, Colo.	16	5	21
Cheyenne, Wyo.	16.5	5	21.5
Helena, Mont.	19.5	6	25.5
Salt Lake City, Utah	16	5	21
Albuquerque, N. M.	16.5	*6.5	23

*Includes city tax of 0.5c.

S. O. California

Phoenix, Ariz.	14	6	20
Los Angeles, Cal.	11.5	4	15.5
San Francisco, Cal.	12	4	16
Reno, Nev.	13.5	5	18.5
Portland, Ore.	12.5	6	18.5
Seattle, Wash.	12.5	6	18.5
Spokane, Wash.	15.5	6	21.5

Note: For discounts, etc., see note under Standard and Flight gasoline above.

Naphtha

In Effect Oct. 14, 1935

(In Tank Wagon or Steel Barrels; in Cents per Gallon)

	Mineral Spirits	V.M.&P. Naphtha	Cleaner Naphtha	*Solvent
Altoona, Pa.	....	....	....	17
Baltimore (net)	11	....	....	11
Boston (net)	11	13	13	11
Bridgeport	....	....	....	13.5
Buffalo (net)	....	....	....	14
Chicago	15.7	16	15	15
Detroit	†17.4	†18.5	....	†18.5
Kansas City	13.4	14.4	14.4	13.4
Lancaster, Pa.	....	....	....	17
Milwaukee	18.3	†19.3	19.3	18.3
Minneapolis	†17.4	†18.4	†18.4	†16.9
Newark (net)	13	....	....	13
New York (net)	11	13	13	11
Philadelphia (net)	11.5	13	13	11.5
Providence (net)	11	11	....	11
Rochester (net)	‡12	....	....	‡12
St. Louis	13.7	14.7	14.7	13
Syracuse	....	....	....	14

Petroleum Spirits (Solvent)

In Tank Cars (F.o.b. refinery or seaboard terminal)	
New York Harbor	9
Philadelphia district	9
Providence	9

Note: 2c off above t.w. prices to large buyers in some instances.

*In the East, prices apply on product generally known as Mineral Spirits; in the middlewest, prices apply on Stanosol (S. O. Indiana grade of Stoddard Solvent).

†At the following points, these taxes and/or discounts apply on the products specified: Detroit, first three products include 3c state tax, prices applying on 150 gals. or more, with prices 1c higher for less than 150 gals.; Milwaukee, V.M.&P. price includes 4c state tax; Minneapolis, first 3 products include 3c state tax; price for solvent for less than 100 gals. is 1c higher.

‡Purchases of at least 150 gallons.

Latest Changes

From Oct. 8 to Oct. 14 inclusive. Dates and amounts of changes shown. See table for full current prices. Changes are on gasoline unless kerosine is indicated.

S. O. New York—Mobilgas:

Rochester, cut 1c, Oct. 9.

Portland, split dealer t.w. up 1c, s.s. up 2c, Oct. 10.

Bangor, split dealer t.w. up 0.8c, s.s. up 1.8c, Oct. 10.

Kerosine:

Hartford, cut 0.25c, Oct. 10.

Imperial Oil—Imperial Three Star:

Hamilton and Toronto, t.w. cut 1c, s.s. cut 1.5c, Oct. 11.

S. O. California—Standard and Flight:

Los Angeles, cut 1c, Oct. 10.

San Francisco, cut 1.5c, Oct. 11.

Corrections

Notation of amount of change and dates not previously shown in table. Table in this issue is corrected to show these changes. Changes are on gasoline unless kerosine is indicated.

S. O. New York—Mobilgas:

Thru Connecticut, up 1c, due to state tax increase to 3c, Oct. 1.

Kerosine:

Rochester, cut 0.5c, Oct. 5.

Magnolia Petroleum—Mobilgas:

Houston, up 1c, Oct. 4.

Metro:

Tulsa, cut 1c, Oct. 1.

Continental Oil—Aviation:

Salt Lake City, cut 1c, Oct. 4.

Imperial Oil, Ltd.—Imperial Three Star:

Vancouver, cut 2.5c, Sept. 7.

Kerosine:

Hamilton and Toronto, cut 1c, Oct. 7.

To Sell Shale Gasoline In South Africa

LONDON — The recently formed **South African Torbanite Mining & Refining Co.** has made arrangements with the controlling organization of gasoline retailers in South Africa for the distribution of its entire output of South African gasoline.

The gasoline — prepared from imported crudes in conjunction with South African torbanite crude—will be marketed towards the end of the year. Wholesale prices will be four cents per gallon less than the present official price of imported gasoline in South Africa.

Deposits of torbanite in South Africa are stated to be three or four times as rich as the shales of Scotland, which have been successfully worked for nearly a century.

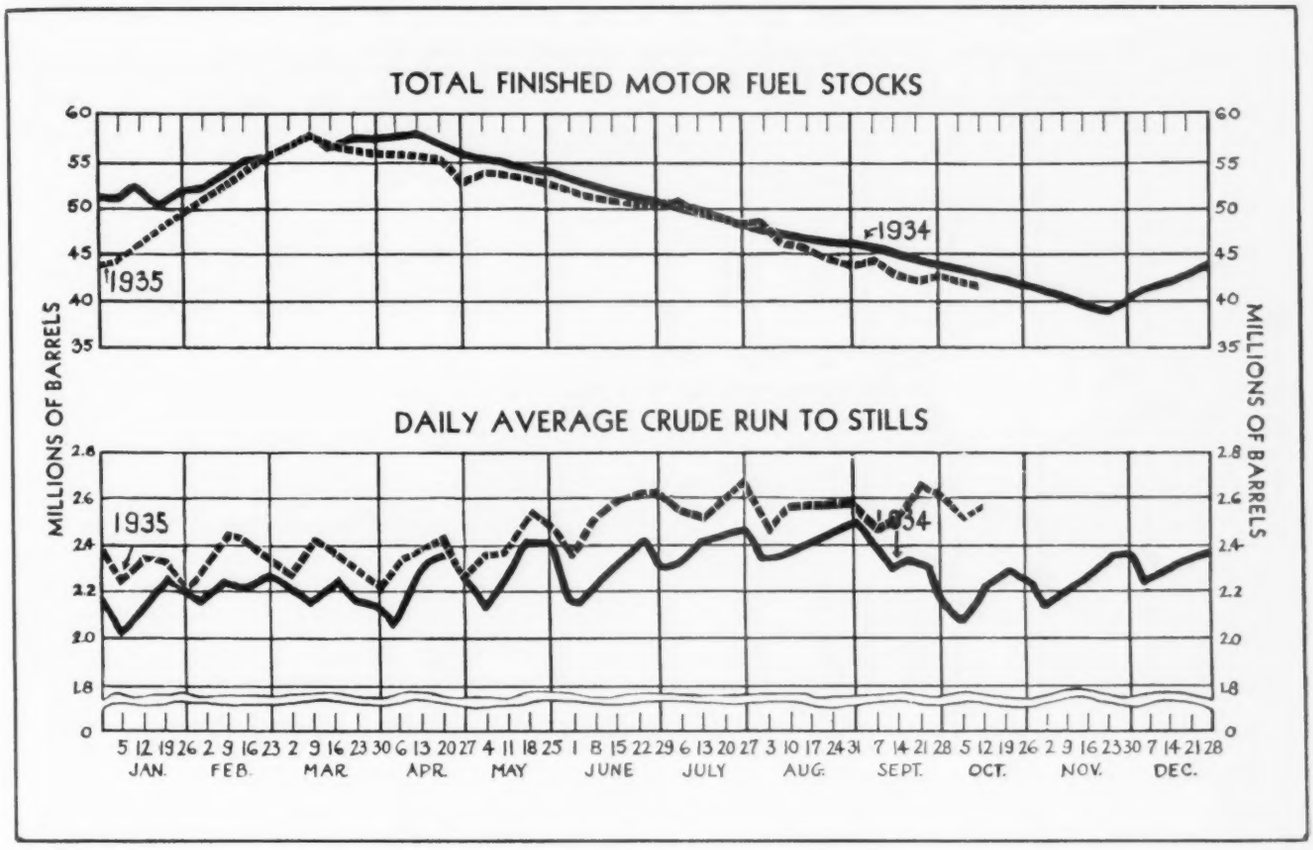
Reports on Progress In Hydrogenation

LONDON, Oct. 9.—With reference to the extraction of oil products from coal, "a recent development," says the British Secretary for Mines in his annual report just issued, "which may offer the best hope of securing a substantial increase in production, is now making progress in this country."

In the fall of 1933 work was begun on the construction of the first commercial scale plant for the production of gasoline from coal by hydrogenation. At first designed to treat coal only, the plant was, during construction, extended to treat creosote and low-temperature tar, and in February, 1935, the production of motor spirit from creosote was commenced. By the middle of July 6,000,000 gallons of first-grade gasoline had been marketed and the coal units were being brought into operation.

"If the results of this commercial scale experiment prove to be satisfactory," reports the secretary of mines, "there is obviously a wide field in this country for the further development of the process, for the present rate of consumption of motor spirit is approximately 1,200,000,000 gallons, or about four million tons per annum."

U. S. Crude Runs and Gasoline Stocks as Reported Weekly by A. P. I.


TOTAL FINISHED MOTOR FUEL STOCKS
MILLIONS OF BARRELS
1935
1934
DAILY AVERAGE CRUDE RUN TO STILLS
MILLIONS OF BARRELS
1935
1934
5 12 19 26 2 9 16 23 2 9 16 23 30 6 13 20 27 4 11 18 25 1 8 15 22 29 6 13 20 27 3 10 17 24 31 7 14 21 28 5 12 19 26 2 9 16 23 30 7 14 21 28
JAN. FEB. MAR. APR. MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC.

Bulk Motor Fuel Stocks Decline 739,000 Barrels

(By Teletype)

NEW YORK, Oct. 15

CRUDE runs to stills, which declined 99,000 barrels the week ended Oct. 5, increased 39,000 barrels, to 2,558,000 barrels the week ended Oct. 12, according to the American Petroleum Institute. Refining plants reported increased operations from 74 per cent of capacity the previous week to 75.1 per cent the past week.

Texas Gulf plants increased runs 48,000 barrels, with an increase of 8 per cent in operations. Central west plants increased runs 23,000 barrels and Mid-Continent plants 17,000 barrels. Runs were lowered 39,000 barrels in the East Coast district.

Motor fuel stocks were reduced further. Bulk stocks decreased 739,000 barrels, to 52,628,000 barrels. The previous week these stocks declined 849,000 barrels. Most of this decline was in refinery stocks which were down 777,000 barrels, standing at 24,427,000 barrels on Oct. 12. Stocks of unfinished gasoline declined 159,000 barrels to 5,256,000 barrels and other motor fuel stocks declined 145,000 barrels to 5,435,000 barrels. In-transit and terminal stocks increased 342,000 barrels, to 17,510,000 barrels the past week.

Total finished motor fuel stocks were lowered 435,000 barrels, standing at 41,937,000 barrels on Oct. 12. East Coast plants showed the largest gain with 570,000 barrels added. The larger decreases were reported at the central west, Mid-Continent, Texas Gulf and California plants. Decreases in these four districts totaled 1,038,000 barrels.

Current Refinery Operations

Districts	Per Cent Capacity Reporting	Daily Average Crude to Stills (Barrels) Week Ended		Per Cent of Reporting Capacity Operated Week Ended		Stocks (Thousands of Barrels) Total Finished Motor Fuel*		Gas & Fuel Oil		Cracked Gasoline Production % Total Capacity Reporting	Daily Av. Production (Barrels) Week Ended	
		Oct. 12	Oct. 5	Oct. 12	Oct. 5	Oct. 12	Oct. 5	Oct. 12	Oct. 5		Oct. 12	Oct. 5
East Coast	100.0	478,000	517,000	78.1	84.5	13,166	12,596	13,169	13,528	100.0	102,000	99,000
Appalachian	94.8	100,000	99,000	68.5	67.8	1,769	1,761	898	933	98.7	27,000	32,000
Ind., Ill., Ky.	95.9	352,000	329,000	83.0	77.6	7,351	7,516	4,398	4,642	99.7	121,000	121,000
Okla., Kans., Mo.	84.8	271,000	254,000	70.6	66.1	3,921	4,134	4,792	4,842	89.1	60,000	65,000
Inland Texas	48.5	81,000	85,000	50.6	53.1	1,051	1,088	1,548	1,555	70.9	22,000	28,000
Texas Gulf	96.4	575,000	527,000	96.6	88.6	4,650	5,101	11,993	11,893	98.5	119,000	129,000
La. Gulf	96.4	130,000	122,000	79.8	74.8	1,005	950	4,722	4,614	96.1	22,000	23,000
No. La., Ark.	90.0	39,000	41,000	54.2	56.9	323	324	479	463	95.7	8,000	10,000
Rocky Mt.	61.9	47,000	41,000	78.3	68.3	553	545	802	792	84.8	13,000	16,000
California	92.6	485,000	504,000	61.5	63.9	8,148	8,357	65,198	65,754	100.0	65,000	59,000
TOTAL	89.5	2,558,000	2,519,000	75.1	74.0	41,937	42,372	107,999	109,016	95.9	559,000	582,000

*Includes stocks at refineries, in bulk terminals, pipe lines and in transit.

SEABOARD MARKETS, Export *and* Coastwise

PRICES *DO NOT* INCLUDE FEDERAL TAX

Where ‡ mark is shown, prices are per barrel of 42 U. S. gallons.

Eastern Domestic

(Prices in cents per gallon tank car lots, unless otherwise noted, f.o.b. refinery or seaboard terminal, representing majority of sales and quotations to jobbers and/or consumers. Florida and S. Carolina inspection tax not included.)

*Motor Gasoline

Prices Oct. 14	60-64 Octane	65 Octane and Above
New York harbor	6.00	6.25
New York harbor, barges	5.75	6.00
Philadelphia district	6.00	6.25
Baltimore district	6.00	6.25
Norfolk district	6.00	6.25
Wilmington, N. C., district	6.00	6.25
Charleston, S. C., district	6.00	6.25
Savannah district	6.25 – 6.50	6.50 – 6.75
Jacksonville district	6.25 – 6.50	6.50 – 6.75
Portland district	6.25	6.50
Boston district	6.00	6.25
Boston district, barges	5.75	6.00
Providence district	6.00	6.25
Providence district, barges	5.75	6.00

*Due to lack of companies offering U. S. Motor gasoline, 59 octane and below in the open market, prices for this grade are discontinued. Quotations nominally are 0.25c below those for 60-64 octane grade.

Water White Kerosine

Prices Oct. 14			
New York harbor	4.75	Savannah district	5.50
N. Y. harbor, barges	4.625	Jacksonville district	5.50
Philadelphia district	5.25	Portland district	5.25
Baltimore district	5.25	Boston district	5.00
Norfolk district	5.25	Boston dist., barges	4.875
Wilmington, N. C.	5.25	Providence district	4.75
Charleston, S. C., dist.	5.25	Providence, barges	4.625

*Fuel Oils

Prices Oct. 14	New York harbor	New York harbor, barges	Philadelphia district
No. 1	4.75	4.625	5.25
No. 2	4.00	3.625– 3.75	4.00
No. 3	4.00	3.625– 3.75	4.00
No. 4	3.625	3.50	3.625
No. 5 (per barrel)	$1.15	.....	$1.15
No. 6 (per barrel)	$0.95	.....	$0.95

	Baltimore district	Boston district
No. 1	5.25	4.75
No. 2	4.00	4.00
No. 3	4.00	4.00
No. 4	3.625	4.00
No. 5 (per barrel)	$1.15	$1.15
No. 6 (per barrel)	$0.95	$0.95

	Boston dist., barges	Providence district	Providence dist., barges
No. 1	4.625	4.75	4.625
No. 2	3.875	4.00	3.875
No. 3	3.875	4.00	3.875
No. 4	3.875	3.625	3.50

*Fuel oils meet specifications of U. S. Commercial Standards CS12-35.

	Bunker Oil Grade C Per Barrel	Diesel Oil Ships' Bunker‡ Per barrel	Gas Oil 28-34 Gravity Per gallon	Diesel Oil Shore Plants Per gallon
New York harbor	*$0.95	*$1.65	4.00	4.00
Philadelphia dist.	*$0.95	*$1.65	4.00	....
Baltimore district	*$0.95	*$1.65	4.00	....
Norfolk district	*$0.95	*$1.65	4.00	....
Charleston district	$0.90	$1.65	....	....
Savannah district	$0.90	$1.65	....	4.50
Jacksonville dist.	$0.90	$1.65	....	4.50
Tampa district	$0.90	$1.65	....	....
Portland district	$1.05	$1.75	....	....
Boston district	$0.95	*$1.65	....	....
Providence district	$0.95	$1.65	....	....

*Lighterage for bunker oil, 5c per bbl. additional; for Diesel oil, 6.5c per bbl. additional.

Pacific Export

(Quotations are at seaboard, Los Angeles, in cargo lots, cents per gallon, except where otherwise noted.)

Prices—	Oct. 14	Oct. 7	Sept. 30
53-55 U. S. Motor	4.50 – 4.75	4.50 – 4.75	4.50 – 4.75
400 e.p. blend 65 Octane and above	4.75 – 5.25	4.75 – 5.25	4.75 – 5.25
38-40 w.w. kerosine, 150 fire point	4.25 – 5.00	4.25 – 5.00	4.25 – 5.00
41-43 w.w. kerosine	4.50 – 5.00	4.50 – 5.00	4.50 – 5.00
44 water white kerosine	5.00	5.00	5.00
Prime wh. kerosine	4.00 – 4.50	4.00 – 4.50	4.10 – 4.50
In Cargo lots, per barrel:			
Diesel fuel oil, above 23.9°	$1.10 –$1.25	$1.10 –$1.25	$1.10 –$1.25
Diesel fuel oil, under 23.9°	$1.05 –$1.15	$1.05 –$1.15	$1.05 –$1.15
30-34 gas oil	$1.10 –$1.15	$1.10 –$1.15	$1.10 –$1.15
Grade C fuel oil	$0.80 –$0.85	$0.80 –$0.85	$0.75 –$0.85
In Ships' Bunkers, or deep tank lots, per barrel:			
Diesel fuel oil, above 23.9 gravity	$1.275–$1.30	$1.275–$1.30	$1.275–$1.30
Diesel, under 23.9 gravity	$1.175–$1.20	$1.175–$1.20	$1.175–$1.20
Grade C fuel oil	$0.925–$0.95	$0.925–$0.95	$0.925–$0.95
Pacific Export (cont'd)	Oct. 14	Oct. 7	Sept. 30
Cased Goods:			
Gasoline, U.S. Motor	$1.40 –$1.50	$1.40 –$1.50	$1.40 –$1.50
Gasoline, 400 e.p. blend	$1.60 –$1.75	$1.60 –$1.75	$1.60 –$1.75
38-40 w.w. kerosine, 150 fire point	$1.15 –$1.30	$1.15 –$1.30	$1.20 –$1.30
Kerosine, prime white	$1.10 –$1.20	$1.10 –$1.20	$1.05 –$1.15

New York Export

(Prices in cents per gallon in barrels, F.a.s. New York)

Cylinder Oils (Pennsylvania Products)

	Oct. 14	Oct. 7	Sept. 30
Bright stock:			
Light, 25 pour point	25.50	25.00	25.00
Dark, 25 pour point	25.00	24.50	24.50
Neutral oil:			
200 3 color, 25 pour pt.	29.00	28.50	28.50
150 3 color, 25 pour pt.	24.00	23.50	23.50
600 Warren E filtered	20.00	20.00	20.00
600 stm. refd. unfiltered	16.50	16.50	16.50
650 stm. rfd. unfiltered	18.00	18.00	18.00
600 flash, steam refined	19.00	19.00	19.00
630 flash, steam refined	24.00	24.00	24.00

Wax Domestic *and* Export

(Prices in cents per pound. Tests made by A. S. T. M. methods. Melting points shown below, however, are A. M. P., 3° higher than A. S. T. M. (E. M. P.) melting points. Export prices are f.a.s. carload lots. Domestic prices are f.o.b. refineries in New York and New Orleans districts, in bags, carload lots, with 0.2c discount allowed for shipment in bulk).

	New York		New Orleans	
Prices—Oct. 14	*Domestic*	*Export*	*Domestic*	*Export*
124-6 Y.C. scale	2.00 – 2.10	2.00 – 2.10	2.00 – 2.10	2.00 – 2.10
122-4 W.C. scale	2.00 – 2.125	2.00 – 2.125	2.00 – 2.125	2.00 –2.125
124-6 W.C. scale	2.00 – 2.15	2.00 – 2.15	2.00 – 2.15	2.00 – 2.15
123-5 Fully refined	4.20	3.625	4.20	3.625
125-7 Fully refined	4.30	3.75	4.30	3.75
128-30 Fully refined	4.55	4.00	4.55	4.00
130-2 Fully refined	4.80	4.25	4.80	4.25
133-5 Fully refined	*5.10	4.75	*5.10	4.75
135-7 Fully refined	*5.35	5.00	....	....

*Shipment either in bags or in bulk.

Gulf Coast

(Prices are f.o.b. Gulf oil terminals representing sellers' opinions except prices specified to the contrary. Prices cover bulk shipments of 20,000 barrels or more, unless otherwise noted.)

Motor Gasoline

For Domestic Shipment

Prices—	Oct. 14	Oct. 7	Sept. 30
59 octane and below	5.25	5.25	5.25
60-64 octane number	5.375– 5.50	5.375– 5.50	5.375– 5.50
65 octane and above	5.50	5.50	5.50

Fuel Oils

No. 1 Fuel oil	3.875– 4.00	3.875– 4.00	3.875– 4.00
No. 2 Fuel oil	3.125– 3.25	3.125– 3.25	3.125– 3.25
No. 4 Fuel oil	2.875– 3.00	2.875– 3.00	2.875– 3.00

Kerosine

41-43 w.w.	4.00	4.00	4.00

Gasoline

For Export Shipment

U. S. Motor gasoline	5.00	4.625	4.50
60-62, 400 e.p. gasoline	5.00	4.625– 4.75	4.625
61-63, 390 e.p. gasoline	5.125– 5.25	4.75 – 4.875	4.75
64-66, 375 e.p. gasoline	5.375	4.875– 5.00	4.875
U. S. Motor, cases (cargoes)	$1.20 –$1.25	$1.20 –$1.25	$1.20 –$1.25
64-66, 375 e.p. cases (cargoes)	$1.25 –$1.30	$1.25 –$1.30	$1.25 –$1.30

Kerosine

44 water white	4.25	4.25	4.25
41-43 water white	3.875– 4.00	3.875– 4.00	3.875– 4.00
41-43 prime white	3.875	3.875	3.875
W.W., cases (cargoes)	$1.15 –$1.20	$1.15 –$1.20	$1.15 –$1.20
P.W., cases (cargoes)	$1.10 –$1.15	$1.10 –$1.15	$1.10 –$1.15

Gas and Bunker Oils

For Domestic and/or Export Shipment

*26-30 translucent gas oil	3.125	3.125	3.125
*30 plus translucent gas oil	3.125	3.125	3.125
*30 plus transp. gas oil	3.125– 3.25	3.125– 3.25	3.125– 3.25
Diesel Oil Ships' bunkers	†$1.50	†$1.50	†$1.50
Grade C bunker oil, for ships' bunkers, per bbl.	†$0.80	†$0.80	†$0.80
Grade C bunker oil, per bbl. in cargoes	$0.70	$0.70	$0.70

*Less than ½ of 1% sulphur. †Lighterage 5c per bbl. additional.

(*Continued on page* 114)

Get Set for the New Models

Penola is Ready With Every Lubricant You Need!

Write Penola

SOON the '36 models will be rolling up for their first lubrication jobs.

It's vital that every dealer have the right products for changed requirements. One thing sure—the 65,000 who sell lubricants manufactured by Penola will be ready!

Penola research engineers have followed the '36 cars right down the production line. And Penola is all set right now with the lubricants needed to service every single model!

That alertness is one good reason why Penola has led the industry for so many years—has become the world's biggest manufacturer of greases, cutting oils and petroleum specialties. It also helps to explain why Penola lubricates one out of every three motor vehicles in the United States—passenger cars, trucks, buses and tractors.

With that record of performance, it's easy to see why Penola is the mainstay of so many thousands of marketers. Why the advice and information they get from Penola are up-to-the-minute and usable. And why the 1,000 specialized Penola products lead the lubrication field!

Maybe you're not entirely clear on the grease requirements of the new cars, or you may need a *special* product to meet a competitive condition. If so, write Penola about it. Marketers have been doing just that for the past 50 years—and Penola engineers have helped them to better business, more customers and bigger profits.

● *Penola products are sold to oil companies and jobbers. Write for prices of standard and special lubricants.*

A FEW PENOLA LUBRICANTS

PENOLA COMPOUND
the Extreme Pressure Lubricant

●

PENOLA GEAR LUBRICANT
in summer and winter viscosities

●

PENOLA PRESSURE LUBRICANTS
in 3 grades for all-year use

●

PENOLA WHEEL BEARING LUBRICANT
won't cake, harden, or separate

●

PENOLA UNIVERSAL LUBRICANTS
for all types of universal joints

●

PENOLA WATERPROOF LUBRICANT
prevents leaks, protects pumps

●

PENOLA EXPEE COMPOUND
for high-speed hypoid drives

PENOLA LUBRICANTS

Penola Inc., 30 Rockefeller Plaza, New York City
(Formerly Pennsylvania Lubricating Company)

Grease works operated at
Baltimore, Md.
Baton Rouge, La. • Eldorado, Kan. • Pittsburgh, Pa.

Seaboard Markets, Export *and* Coastwise

Where $ mark is shown, prices are per barrel of 42 U. S. gallons. ***Prices Do Not Include Federal Tax***

(*Continued from page* 112)

Mexican Crude and Bunker Oils

(F.o.b. Steamer, Tampico)

Prices—	Oct. 14	Oct. 7	Sept. 30
Heavy Panuco crude taxes to be paid, per bbl.	$0.88 -$0.90	$0.88 -$0.90	$0.88 -$0.90
Grade C bunker oil, ships' bunkers, taxes paid, per bbl.	$0.80	$0.80	$0.80

Mid-Continent Lubricating Oils

(Prices in cents per gallon in bbls. f.a.s. Gulf terminals. In drums and new barrels, 0.5c to 1c higher per gal. in some instances.)

190-200 vis. D 210 brt. stk.	23.50 -24.00	23.50 -24.00	23.00 -23.50
150-160 vis. D 210 brt. stk.:			
0-10 pour point	20.50 -21.00	20.50 -21.00	20.00 -20.50
10-25 pour point	20.50 -21.00	20.50 -21.00	20.00 -20.50
25-40 pour point	19.50 -20.00	19.50 -20.00	19.00 -19.50
150-160 vis. E 210 brt. stk.	19.50 -20.00	19.50 -20.00	19.00 -19.50
120 vis. D 210 bright stock	19.75 -20.00	*19.75 -20.00	19.25 -19.75
180 vis. No. 3 color neutral oil:			
0-10 pour point	17.25 -17.50	17.25 -17.50	17.25 -17.50
15-30 pour point	16.25 -16.75	16.25 -16.75	16.25 -16.75
200 vis. No. 3 color neutral oil:			
0-10 pour point	17.75 -18.25	17.75 -18.25	17.75 -18.25
15-30 pour point	16.75 -17.25	16.75 -17.25	16.75 -17.25
600 s.r. olive green	12.00 -12.50	12.00 -12.50	12.00 -12.50
600 s.r. dark green	9.25 -10.50	9.25 -10.50	9.25 -10.50
531 s.r.	15.00 -15.50	15.00 -15.50	14.00 -14.50

*Correction: Correct price for Oct. 7 was 19.75-20.00c instead of 19.75-20.25.

South Texas Lubricating Oils

(Viscosity at 100° F. pour test 0. Tanker, f.o.b. Gulf oil terminals, for export shipment)

Unfiltered Pale Oils:

Vis. Color			
100 No. 3	5.50 – 6.00	5.50 – 6.00	5.50 – 6.00
200 No. 3	6.375– 7.00	6.375– 7.00	6.375– 7.00

South Texas Lubricating Oils (cont'd)

Unfiltered Pales (cont'd)

Prices—	Oct. 14	Oct. 7	Sept. 30
300 No. 3	7.00 – 7.50	7.00 – 7.50	7.00 – 7.50
500 No. 3½	7.875– 8.50	7.875– 8.50	7.875– 8.50
750 No. 4	9.00 – 9.50	9.00 – 9.50	9.00 – 9.50
1200 No. 4	9.50 –10.00	9.50 –10.00	9.50 –10.00
2000 No. 4	9.75 –10.25	9.75 –10.25	9.75 –10.25
Red Oils:			
Vis. Color			
100 No. 5-6	5.50 – 6.00	5.50 – 6.00	5.50 – 6.00
200 No. 5-6	6.125– 6.75	6.125– 6.75	6.125– 6.75
300 No. 5-6	6.75 – 7.00	6.75 – 7.00	6.75 – 7.00
500 No. 5-6	7.25 – 7.625	7.25 – 7.625	7.25 – 7.625
750 No. 5-6	9.00 – 9.50	9.00 – 9.50	9.00 – 9.50
1200 No. 5-6	9.50 –10.00	9.50 –10.00	9.50 –10.00
2000 No. 5-6	9.75 –10.25	9.75 –10.25	9.75 –10.25

Note: Red oil prices shown above cover oils with green cast; prices for blue cast red oils are slightly lower in some cases.

Tanker Rates

(Approximate tanker freight rates to Continental ports, in shipments per ton of 2240 pounds, British sterling: to U. S. ports, cents per barrel)

Rates—Oct. 14	Crude &/or Fuel Last Paid	Crude &/or Fuel Owners Ask	Refined Oil &/or Spirits Last Paid	Refined Oil &/or Spirits Owners Ask
Calif. U.K./Continent*	14/	15/-16/	15/	15/3-16/3
Gulf-U.K./Continent*	11/	11/6-12/3	13/6	13/-14/
Calif.-N. Atlantic (not E. of N. Y.)	46c	50-52c	42c	48-52c
Gulf-N. Atlantic** (not E. of N. Y.)	†15c	†15-16c	18c	18-19c

Note: Dirty boat quotations are enlarged to cover, "Fuel and Light Crude" quotations.

*Continental ports in range between Bordeaux and Hamburg, both inclusive.

**Venezuela loading same rate: Tampico 2c to 3c per bbl. additional.

†Rates for heavy crude or fuel 1c to 2c higher than for light crude.

Tennessee Oil Men to Meet

NASHVILLE, Oct. 12.—The first general meeting of the Tennessee Oil Men's Association in two years will be held at the Hermitage hotel, Nashville, Oct. 21 and 22.

The association had been inactive during the life of the petroleum code, but has recently been reorganized.

A large attendance is anticipated. A program of outside speakers has been arranged. A banquet and entertainment has been provided for. Matters of vital importance to association members will be discussed, according to L. W. Collins, secretary.

Forms Packaging Exposition Council

NEW YORK, Oct. 9.—A packaging conference and exposition council of 75 members has been formed to assist in developing definite plans for conferences and clinics to be held in conjunction with the Sixth Packaging Exposition here March 3 to 6, 1936, it was announced today by Alvin E. Dodd, managing director of the American Management Association, which is sponsoring the exposition.

White Star Named in Suit

DETROIT, Mich., Oct. 9.—Claiming that the oil which seeped from the refinery of the White Star Division of Socony-Vacuum at Trenton, Mich., into Brownstown Creek made its land holdings practically worthless, the Gibralter Realty Co. filed a suit for $600,000 damages in Federal Court. The suit charges that subdivisions laid out along the creek lost much of their sales appeal due to offensive odors coming from the contaminated water. The real estate men also declared that the oil spread to the canals, killing fish and vegetation. The company listed investments of $1,225,000 in the land and improvements.

Burner Institute Adopts New Working Policies

NEW YORK, Oct. 9.—Action towards formal adoption of the major policies of the Oil Burner Institute was taken here this week by the board of directors, according to W. J. Smith, Cleveland, president.

The Institute is getting under way on a program which includes as its main objective the increasing of public demand for oil burning appliances and the increased use of oil as a fuel, it was stated.

The Institute announced that it had concluded a formal plan of co-operation with the American Petroleum Industries Committee whereby they would work together on legislative matters of interest to the oil and oil burner industries.

Announcement also was made that the American Petroleum Institute had appointed Dr. R. P. Anderson, secretary of its division of refining, as a representative in the associate membership of the Oil Burner Institute.

A formal adoption was made of the O.B.I. seal for use on equipment and in advertising by members. It can be used only by members in good standing on equipment sold under their trade or company name. An attempt will be made to educate the public to the acceptance of this seal as a mark of merit on oil burning equipment.

The board announced that the twelfth National Oil Burner Show will be held in Detroit from April 14 to 18, 1936. Other details are to be announced later.

A.P.I. Credit Committee

NEW YORK, Oct. 12.—W. M. Watson, Socony-Vacuum Oil Co., New York, has been named chairman of the new Committee on Credit Practices of the American Petroleum Institute.

The Institute had a credit practice committee prior to the NRA petroleum code, but it was discontinued when the Planning and Co-ordination Committee was appointed by the government.

Bridge Party Planned

CHICAGO, Oct. 11.—The Fall bridge and dinner party of the Chicago Oil Men's Club will be held Thursday evening, Oct. 24 at club headquarters, 616 S. Michigan Ave., Chicago.

Dinner will be served at 6:00 p. m. with the bridge tournament immediately following.

CRUDE OIL MARKETS

Prices in $ per bbl. of 42 U. S. gals. at the well, A. P. I. gravity. Prices are effective as of 7 a.m. of dates as given.

Eastern Fields

Posted by Joseph Seep Purchasing Agency

(Effective Sept. 6, 1935, except Macksburg, O. effective July 16, 1935 and Corning effective Oct. 2, 1933)

Penna. Grade Oil in Southwest Penna. Pipe Lines.....$1.72
Penna. Grade Oil in Eureka Pipe Lines (West Virginia).....$1.67
Penna. Grade Oil in Buckeye Pipe Lines (Macksburg, O.).....$1.52
Corning Oil in Buckeye Pipe Lines (Ohio)...$1.32

Posted by Other Companies

Tide Water Pipe Co., Ltd.:
Bradford-Alleghany district (Penna. and N. Y.) (Effective Sept. 6, 1935).....$2.00
*The Pennzoil Co.: (Effective Sept. 6, 1935)
Penna. Grade Oil in National Transit Lines*$1.97
Ashland Oil & Transportation Co.:
Somerset Oil in Ashland Lines (Ky.) (Effective May 20, 1935).....$1.13

*The Pennzoil Co. posts $1.97 in Cochran, Franklin, Hamilton and Doolittle, Pa. fields; prices in other districts range down to $1.92 per bbl. at well.

Michigan

(Posted by Pure Oil Co.)

Midland, Midland County (Sept. 30, 1933)..$1.02

(Posted by Simrall Pipe Line Corp.)

West Branch (Apr. 1, 1934).....$0.86

Central States Fields

Posted by Ohio Oil Co.

Effective Feb. 1, 1935)		(Effective May 22, 1935)	
Lima	$1.15	West. Kentucky	$1.13
(Effective Jan. 5, 1934)			
Princeton	$1.13	Illinois	$1.13

Canadian Fields

Posted by Imperial Oil Refineries, Ltd.

Western Ontario

(Effective Sept. 9, 1933)

Petrolia.....$2.10
Oil Springs.....$2.17

Alberta—Turner Valley

(Prices f.o.b. field tankage)

Crude: (Effective Dec. 9, 1933)		Naphtha: (Effective May 21, 1934)	
40-44.9	$1.50	†Clear	$2.31
45-49.9	2.07	†Discolored	$2.55
(Effective May 21, 1934)			
50 and above	$2.19		

†Clear naphtha: 22 color; 10 lbs. vapor pressure, Reid method; 90% recovery; end point, 410°, Discolored naphtha: same specifications as for clear naphtha except color.

Mid-Continent

Posted by Stanolind Crude Oil Purchasing Co

(Effective Sept. 29, 1933)

(In Oklahoma-Kansas)	(In North-North Central Texas)
Below 29.....$0.84	$0.79
29-29.9..... 0.86	0.81
30-30.9..... 0.88	0.83
31-31.9..... 0.90	0.85
32-32.9..... 0.92	0.87
33-33.9..... 0.94	0.89
34-34.9..... 0.96	0.91
35-35.9..... 0.98	0.93
36-36.9..... 1.00	0.95
37-37.9..... 1.02	0.97
38-38.9..... 1.04	0.99
39-39.9..... 1.06	1.01
40 and above..... 1.08	1.03

Above Stanolind prices met as follows:

Sept. 29, by The Texas Co. in Oklahoma, and in North and North Central Texas; Continental Oil in all three states; by Empire, White Eagle and Gypsy (Gulf).

See also Carter Oil, Magnolia, Humble schedules below and footnotes under Carter table.

Posted by Carter Oil Co.

(In Oklahoma and Kansas)

(Effective Sept. 29, 1933)

Below 25	$0.76	33-33.9	$0.94
25-25.9	0.78	34-34.9	0.96
26-26.9	0.80	35-35.9	0.98
27-27.9	0.82	36-36.9	1.00
28-28.9	0.84	37-37.9	1.02
29-29.9	0.86	38-38.9	1.04
30-30.9	0.88	39-39.9	1.06
31-31.9	0.90	40 and above	1.08
32-32.9	0.92		

Sept. 29, Carter gravity and price schedule met in Oklahoma-Kansas by Sinclair-Prairie, and Humble price schedule met in North-North Central Texas except that Sinclair-Prairie posts five lower grades down to below 25, with 2c differential for each. Same day, Shell Petroleum met Carter in full in Oklahoma-Kansas.

Posted by Magnolia Petroleum Co.

(Effective Sept. 29, 1933)

In Oklahoma, same schedule as Carter Oil, which see above, beginning with below 25, at $0.76 and ending with 40 & above, at $1.08.

In Texas: North and North Central, including Burkburnett, Archer, Stephens, Henrietta, Electra, Comanche and Olden; and in Central Texas, including Mexia, Wortham, and Panola county, same gravity and price schedule as Stanolind in Texas, which see above, beginning with below 29 at $0.79, and ending with 40 and above, at $1.03.

†Posted by Humble Oil & Refining Co.

(*In North, North Central and Central Texas)

(Effective Sept. 29, 1933)

Below 29	$0.79	35-35.9	$0.93
29-29.9	0.81	36-36.9	0.95
30-30.9	0.83	37-37.9	0.97
31-31.9	0.85	38-38.9	0.99
32-32.9	0.87	39-39.9	1.01
33-33.9	0.89	40 and above	1.03
34-34.9	0.91		

*Including North Texas, Ranger, Mexia, Powell, Boggy Creek, Richland, Wortham, Currie and Moran fields.

†Effective Dec. 1, 1934, Humble prices are based on 99% tank tables at 60F. Allowance or deduction of 1% is made for each 25° change in temperature above or below 60F.

Panhandle Texas

Posted by Humble Oil & Refining Co.

(Effective Sept. 29, 1933)

	Gray County	Carson-Hutchinson
Below 35	$0.79	$0.69
35-35.9	0.81	0.71
36-36.9	0.83	0.73
37-37.9	0.85	0.75
38-38.9	0.87	0.77
39-39.9	0.89	0.79
40 & above	0.91	0.81

Sept. 29, above prices met by Sinclair-Prairie, Magnolia and The Texas Co. in the entire area, also by Continental Oil in Carson-Hutchinson.

East Texas

(Effective Sept. 29, 1933)

Stanolind, Humble, Sinclair-Prairie, Texas and Magnolia.....$1.00

West Texas and New Mexico

Posted by Humble Oil & Refining Co.

(Effective Sept. 29, 1933)

Ector, Pecos and Winkler Counties, W. Texas and Lea Co., N. M.....$0.75
Crane, Upton, Crockett, Howard and Glasscock county, W. Tex.....$0.70

Sept. 29, Magnolia met in Crane, Upton, Howard, Glasscock, Mitchell and Winkler. Sept. 29, Texas Co. met Humble in Winkler, Crane, Upton and Lea counties; Stanolind Oil & Gas met in Hendrich field, Winkler county and posted in Marion county, Tex. below 25 at $0.63, plus 2c differential to 40 & above at $0.95.

South and Southwest Texas

Posted by Humble Oil & Refining Co.

(Effective Sept. 29, 1933)

Darst Creek	$0.87	Pettus	$1.05
Salt Flat	0.87	Tomball	1.15

(Effective June 29, 1935)

Saxet	$0.80	Mirando	$0.75

(Effective Aug. 20, 1935)

Anahuac (Chambers county) and Dickinson (Galveston county)

30-30.9	$0.94	36-36.9	$1.06
31-31.9	0.96	37-37.9	1.08
32-32.9	0.98	38-38.9	1.10
33-33.9	1.00	39-39.9	1.12
34-34.9	1.02	40 & above	1.14
35-35.9	1.04		

Sept. 30, The Texas Co. met Humble in Darst Creek. On Sept. 29 it posted $0.80 in Duval county and $0.85 in Saxet-Greta.

Oct. 2, Magnolia posted $0.87 in Darst Creek and $1.15 in Tomball; Sept. 29 it posted $0.75 in Luling and $0.95 in Lytton Springs; on July 3, 1935, $0.75 for Mirando. Jan. 11, 1934 $1.00 for Cleveland, Liberty county, Tex.; Aug. 8, 1935, $0.93 in Hardin, Liberty county, Tex.

Posted by Humble

Conroe *(Montgomery Co., Tex.)*

(Effective Sept. 29, 1933)

35-35.9	$1.09	38-38.9	$1.15
36-36.9	1.11	39-39.9	1.17
37-37.9	1.13	40 & above	1.19

Sept. 30 Texas Co. met above prices.

North Louisiana-Arkansas

Posted by Standard Oil Co. of Louisiana

(Effective March 17, 1934, except Homer, Smackover and Nevada county, Sept. 29, 1933).

(In Caddo, Homer, Haynesville, Sabine, De Soto Sarepta, Carterville, El Dorado and Miller county)

Below 25	$0.71	33-33.9	$0.89
25-25.9	0.73	34-34.9	0.91
26-26.9	0.75	35-35.9	0.93
27-27.9	0.77	36-36.9	0.95
28-28.9	0.79	37-37.9	0.97
29-29.9	0.81	38-38.9	0.99
30-30.9	0.83	39-39.9	1.01
31-31.9	0.85	40 and above	1.03
32-32.9	0.87		

Smackover, Ark.....$0.70
Nevada, Ark.....0.60
Urania, La. (La. Oil Refg. Co., Jan. 1, '34)... 0.87

*Gulf Coastal Fields

Posted by Humble Oil & Refining Co.

(Effective Sept. 29, 1933)

Below 20	$0.82	27-27.9	$0.98
20-20.9	0.84	28-28.9	1.00
21-21.9	0.86	29-29.9	1.02
22-22.9	0.88	30-30.9	1.04
23-23.9	0.90	31-31.9	1.06
24-24.9	0.92	32-32.9	1.08
25-25.9	0.94	33-33.9	1.10
26-26.9	0.96	34 and above	1.12
Refugio heavy (Effective June 29, 1935)			$0.80

Effective Dec. 1, 1934 Humble prices are based on 99% tank tables at 60 F. Allowance or deduction of 1% is made for each 25° change in temperature above or below 60 F.

*Includes these fields: Barbers Hill, Goose Creek, Hull, Humble, Liberty, Moss Bluff, Orange, Pierce Junction, Rabbs Ridge, Raccoon Bend, Refugio light, Sour Lake, Spindletop, Sugarland, and West Columbia.

Above prices met Sept. 29 by Sinclair-Prairie and Sun Pipe Line Co.

Posted by The Texas Co.

(Effective Sept. 30, 1933)

Same gravity and price schedule as Humble up to 30-30.9 gravity, which see; plus these grades:

30-30.9	$1.04	36-36.9	$1.10
31-31.9	1.05	37-37.9	1.11
32-32.9	1.06	38-38.9	1.12
33-33.9	1.07	39-39.9	1.13
34-34.9	1.08	40 and above	1.14
35-35.9	1.09		
Partlavaca (Tex. Gulf effective May 17, 1935)			$0.80

Rocky Mountain Fields

Posted by Stanolind Oil & Gas Co.

(Effective Sept. 29, 1933)

Salt Creek and Dutton Creek, Wyo. Same schedule as Stanolind posts in Oklahoma-Kansas which see on first crude price page.

Elk Basin, light.....$1.18
Grass Creek, light..... 1.18
Grass Creek, heavy..... 0.62
Greybull-Torchlight..... 1.18
Iles, light, Col..... 0.96
Iles, heavy..... 0.90
Hogback, N. M..... 1.11
Frannie light (Effective May 1, 1934)..... 0.70
Frannie heavy..... 0.62

Posted by Ohio Oil Co.

(Effective Sept. 29, 1933)

Elk Basin, Wyo.....$1.18
Grass Creek, light..... 1.18
Rock Creek..... 1.02
Big Muddy..... 1.01
†Sunburst, Mont. (Effective July 19, 1935)... 1.20

†Met by Texas Co. July 19.

Posted by *International Refining Co.

(Effective May 23, 1934)

Cutbank, Mont.....$1.45

*Texas Co. subsidiary.

(Continued on next page)

Warner Quinlan Files Bankruptcy Plea

NEW YORK, Oct. 11.—Judge Hulbert has granted the Warner Quinlan Company's voluntary petition for reorganization of the company under 77-B of the national bankruptcy act, L. V. Nicholas, president of the company stated today. The present management of the company will be continued as operators, it was said.

Early in October three holders of the company's debentures filed a petition in involuntary bankruptcy under section 77-B. It was charged that the company had liabilities of approximately $100,000 in excess of assets. The company listed assets of over $21,000,000 and liabilities of over $14,000,000 in its consolidated balance sheet for its 1934 operations.

The Cities Service Co. owns or controls approximately 54 per cent of the outstanding stock of Warner Quinlan and is also its largest creditor.

Get Safety Truck Award

NEW YORK—The safe operation of its 1950 trucks over 25,000,000 miles in a year brought a special honorable mention to the Esso Marketers group from the American Trucking Associations, Inc., in a recent safety contest. The Esso fleet was the largest in the contest.

J. F. Winchester, in charge of truck operations for the Esso group, was made chairman of the national safety committee of the A.T.A. The committee recently established a safety research fund which will be used to finance safety campaigns in co-operation with the Interstate Commerce Commission, National Safety Council and the United States Bureau of Public Roads.

Nebraska Jobbers Seek Illegal Tax Refund

LINCOLN, Neb.—Argument on a motion to dismiss the jobber's case to recover about $1,000,000 paid to the state of Nebraska under the 1-cent gasoline tax law, declared unconstitutional late last month, has been postponed until Oct. 24.

Nebraska's legislature last spring, to provide funds for relief of the needy and old age pensions, imposed an additional 1-cent gasoline tax, effective March 1. This relief act was declared unconstitutional Sept. 20, annulling the gasoline tax increase. About $1,000,000 was collected.

Nebraska Petroleum Marketers, Inc., has sought a refund of this tax collected, contending the levy was on the privilege of importing gasoline into the state.

Attorney General Wright, who filed a motion to dismiss the case, has filed a brief claiming funds held by the state treasurer belong to the consumer, not to the gasoline dealers.

Mid-Continent Market

(*Continued from page* 102)

0.125 cent late in the week. Several quoted 4.875 cents for regular run East Texas gasoline. Quotations at 4.75 cents were subject to prior sale or confirmation.

Supplies of motor fuel in other districts were closely held and prices steady.

The kerosine market continued colorless except for an increase in North Texas prices. Texas refiners have been making only small quantities of kerosine over the past few weeks. Subsequently the increased demand from the agricultural trade in the Rio Grande Valley caught refiners short of material.

Mid-Continent bright stock prices were being pushed higher by increased inquiry for export. Prices the past week increased another 0.5 cent, bringing medium pour test 150-160 oil up to 16 cents. Neutral oils failed to budge from the levels attained months ago. South Texas 100 viscosity oil was scarcer as use of 10-W oil got under way. This grade is especially suitable for blending up a winter oil. Other grades generally showed little change.

A sudden increase in activity for wax was experienced during the week. Buyers who have been holding to the sidelines were reported actively seeking supplies. It was thought that possibility of higher insurance rates due to war risks might be responsible for the activity. Wax also is used in the manufacture of munitions and along with other necessary war materials was getting a good play. Prices were up several points.

CRUDE OIL MARKETS

Continued from preceding page

CALIFORNIA, Posted by Standard Oil of California

All gravities above those quoted take highest price offered in the field. Effective Aug. 29, 1935

Gravity	Signal Hill	Seal Beach Alamitos Heights	Huntington Beach	Inglewood	Playa Del Rey	Olinda-Brea Canon	Athens-Rosecrans Dominguez	Elwood Terrace	Torrance	Richfield	Whittier-La Habra	Montebello	Coyote Hills	Santa Fe Springs	Newhall McKittrick Kern River	Mountain View	Midway Sunset Elk Hills Buena Vista Hills	Lost Hills	Coalinga	Wheeler Ridge	Santa Paula (Union Oil Co.)	Orcutt (Union Oil Co.)
14-14.9	$0.65	$0.65	$0.65	$0.65	$0.65	$0.65	....	....	$0.65	$0.65	$0.65	$0.65	$0.65	....	$0.57	$0.57	$0.57	$0.57	$0.57	$0.57	$0.57	....
15-15.9	.65	.65	.63	.63	.61	.63	....	....	.63	.63	.63	.63	.63	....	.57	.57	.57	.57	.57	.57	.57	....
16-16.9	.63	.63	.61	.61	.58	.61	....	....	.61	.61	.61	.61	.61	....	.57	.57	.57	.57	.57	.57	.57	$0.57
17-17.9	.61	.61	.59	.59	.55	.59	....		.59	.59	.59	.59	.60	....	.57	.57	.57	.57	.57	.57	.57	.57
18-18.9	.60	.60	.57	.57	.52	.57	....		.58	.57	.57	.58	.59	....	.57	.57	.57	.57	.57	.57	.57	.57
19-19.9	.58	.58	.55	.56	.49	.56	....		.57	.56	.55	.57	.58	....	.57	.57	.57	.57	.56	.56	.57	.56
20-20.9	.57	.57	.53	.55	.46	.55	....		.56	.55	.54	.56	.57	....	....	.57	.57	.57	.55	.55	.56	.55
21-21.9	.56	.56	.52	.54	.43	.54	....		.55	.54	.53	.55	.56	$0.57	....	.56	.56	.56	.54	.54	.55	.54
22-22.9	.55	.55	.51	.53	.40	.53	....		.54	.53	.52	.54	.55	.56	....	.56	.56	.56	.53	.53	.54	.53
23-23.9	.54	.54	.50	.52	.39	.52	$0.55	F.O.B. Ship	.53	.52	.51	.53	.54	.55	....	.55	.55	.55	.52	.52	.53	.52
24-24.9	.53	.53	.49	.51	.38	.51	.54	....	.52	.51	.50	.52	.53	.54	....	.54	.55	.54	.51	.51	.52	.51
25-25.9	.52	.52	.48	.50	.37	.50	.53	....	.51	.50	....	.51	.52	.54	....	.53	.54	.54	.50	.50	.51	.50
26-26.9	.51	.51	.47	.49	.36	.49	.52	....	.50	.49	....	.50	.51	.53	....	.52	.53	.53	....	....	.50	....
27-27.9	.50	.50	.46	.48		.48	.51	....	....	.48	....	....	.50	.52	....	.51	.52	.53	....	....	.49	....
28-28.9	.49	.49	.45	.47		.47	.50	....	....	.47	....	....	.49	.51	....	.50	.51	.52	....	....	.48	....
29-29.9	.48	.48	.44	.46		....	.48	....	....	.46	....	....	.48	.50	....	.49	.50	.51	....	....	.47	....
30-30.9	.47	.47	.43	.45		....	.46	....	....	Kettleman Hills			.47	.49	....	.48	.49	.50	....	....	.46	....
31-31.9	.46	....	....	.44		....	.45	....	....				.46	.48	....	.47	.48	....	....	....	....	....
32-32.9	....	....	....	.43		....	.44	....	....				.45	.47	....	.46	.47	....	....	....	....	....
33-33.9	....	....	....	....		....	....	$0.50	....	$0.62			.44	.46	....	.45	.46	....	....	....	....	....
34-34.9	....	....	....	....		....	....	.49	....	.61			.43	.45	....	....	....	....	....	....	....	....
35-35.9	....	....	....	....		....	....	.48	....	.60			....	.44	....	....	....	....	....	....	....	....
36-36.9	....	....	....	....		....	....	.47	....	.59			....	.43	....	....	....	....	....	....	....	....
37-37.9	....	....	....	....		....	....	.46	....	.58			....	.42	....	....	....	....	....	....	....	....
38-38.9	....	....	....	....		....	....	....	....	.57			....	.41	....	....	....	....	....	....	....	....
39-39.9	....	....	....	....		....	....	....	....	.56			....	....	....	....	....	....	....	....	....	....

Subject to Field Gathering Charge of 5c per Bbl.

Cooler Weather Brings Increased Demand for Light Fuel Oils

ALTHOUGH light fuel oil prices were generally unchanged the second week of October, a slight increase in buying and a good inventory position of supplies at refineries combined to make a firmer market. The heavier fuel oils remained dull, and price shading was indulged in to some extent.

Most of the demand for the light grades came from northern sections where colder weather has already set in. Volume of buying, taken as a whole, however, was not sufficient to boost prices, although a firmer trend was noted.

The heavy grades of fuel oil showed no signs of coming out of the lethargy that they have been in for some time. Apparently supplies were out of line with demand, but as yet no open price break has materialized.

Supplies of 36-40 fuel oil in the hands of Pennsylvania refiners were about even with demand. Practically all the material moving out of refineries was going at unchanged prices.

* * *

CHICAGO, Oct. 12.—The Mid-Western tank car market for light fuel oils was influenced chiefly by outside developments, notably a sharp decline in available supplies from East Texas and Michigan plants, Chicago traders reported the week ended Oct. 12.

As supplies from these two districts available to Chicago resellers diminished, they began looking to other districts for oil to apply on commitments.

Several reported that shipping instructions placed with plants in Michigan and East Texas were not being complied with promptly, and they were forced to place instructions in other districts, notably Oklahoma.

Although prices were in better shape than had been the case for some time, and while the cooler weather had attracted some additional buying, support at present lacked power and no general price rally was evident.

A minimum of 3.125 cents for No. 1 prime white fuel oil was being adhered to by all sellers throughout the week.

The position of heavy fuel oils in the Mid-Western tank car market was puzzling to virtually all traders. Despite the heavy stock position which was reported for these oils, prices were fairly steady. However, indications were that "special prices" were garnering most of the industrial business available.

TULSA, Oct. 12.—Colder weather in the north the past week has stimulated inquiry for light fuel oils in the Mid-Continent. Several of these inquiries have developed into actual business. But for the most part activity has been limited to feeling the market out.

Supplies of Nos. 1, 2 and 3 oils were well held, especially the low end point oils. No. 1 prime white oil was quoted at a low of 3.125 cents, Group 3, although offerings at this price were becoming scarce. Most quotations for that commodity were 3.25 cents. The No. 2 oil was about an 0.125 cent below the No. 1 oil.

The East Texas U. G. I. oil market was relieved of excess offerings the past week by an order for shipment to the Gulf. Prices generally were held at 2.125 cents, f.o.b. East Texas plants. In other districts this oil was sluggish.

Railroads still were reluctant to order out anything above the minimum amounts of heavy fuel specified in their contracts. One company, however, did indicate that attempts would be made to catch up on tardy shipping instructions. Others continued to order out only their minimum requirements. Prices were unchanged.

* * *

NEW YORK, Oct. 12.—Some improvement in demand from home owners for light fuel and range oil was reported at northern seaboard points during the week ended Oct. 12. The weather, however, still was too mild to cause any unusual call for these products.

Tank car and barge prices continued spotty, particularly for the No. 2 fuel oil. Occasional sales of this product had been reported at under the general going market but the volume had not been large enough to cause any break in prices. However, this competition became stronger at New York harbor this week and several suppliers lowered their prices 0.125 cent. This brought barge quotations down to 3.625 cents a gallon, in some quarters.

No retail fuel oil price changes were reported along the seaboard, although distributors were hopeful that with the advent of cold weather there would be some increases.

Fuel Oils

Following are tank wagon prices of various grades of heating oil at the points shown in various territories. Prices are in cents per gallon.

Prices in Effect Oct. 14, 1935

	No. 1	No. 2	No. 3	No. 4
S. O. New Jersey				
Newark, N. J.	7.5	6	6	6
Atlantic City, N. J.	8	6.5	6.5	6
Baltimore, Md.	7.5	6	6	5.5
Washington, D. C.	8	6.5	6.5	6.5

Discounts: At Newark and Atlantic City, purchasers taking 50,000 gals. get discount of 0.5c per gal.

Socony-Vacuum Oil Co., Inc.				
(S. O. New York Division				
New York City	7.25	6.25	6.25	5.75
Albany, N. Y.	7.5	6.5	6.5	6.5
Rochester, N. Y.	8.5	7	7	7
Boston, Mass.	7	6.25	6.25	6.25
Bangor, Me.	9.5	6.5	6.5	6.5
Manchester, N. H.	9	7.25	7.25	7.25
Burlington, Vt.	8.5	7	7	7
New Haven, Conn.	7.5	6	6	6
Providence, R. I.	7	6	6	6

Discounts: At New York City, consumers taking 10,000 to 50,000 gals., get 0.25c per gal. discount when minimum amount has been reached; above 50,000 gals., 0.5c

	No. 1	No. 2	No. 3	No. 4
Atlantic Refining				
Philadelphia, Pa.	6.50	5.50	....	5.5
Allentown, Pa.	9	7.5	7.5	7.5
Wilmington, Del.	8.5	7	....	6.5
Springfield, Mass.	8.75	7.25	....	7.25
Worcester, Mass.	8.75	7.25	....	7.25
Hartford, Conn.	8.5	7	....	7
S. O. Ohio				
Ohio Statewide	8	7.75	7.50	7.25

Note: S. O. Ohio prices are for hose dumps; bucket dumps are 0.5c per gallon higher.

S. O. Indiana

Stanolex Fuel Oil No. 1

Chicago	7
Indianapolis, Ind	*13.4
Detroit, Mich	7.5
Minneapolis, Minn	9.2
Sioux City, Ia	8.8
St. Louis, Mo	8.5
Kansas City, Mo	8.2

*Includes state tax of 4c.

Discounts: at Chicago above fuel oil prices apply on 150 gals. or more; 100 to 149 gals., 0.5c higher, under 100 gals., 1.5c higher. Indianapolis and Detroit 1c off t.w. price for deliveries of 100 gals. and over; at St. Louis, 1c off for 50 gal. dumps and over; at other above points, 1c off t.w. price for deliveries 150 gals. and over.

Canadian Gasoline Imports

OTTAWA—In July Canada imported 3,490,904 gallons of casinghead gasoline lighter than .6690 specific gravity from the United States and 2,547,260 gallons from Peru. Of gasoline lighter than .8235 specific gravity she imported 1,796,897 gallons from the United States in July, 41,522 gallons from Alaska and 400,000 gallons from Roumania.

Canadian Tariff Board Hearing

OTTAWA — The Canadian Tariff Board will hold the final and most important hearing on the tariff on gasoline and other petroleum products at Ottawa, beginning on Nov. 18 next. All briefs must be in the hands of the Board by Oct. 29. This hearing was postponed in order that it might come after the Dominion elections on Oct. 14.

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New Patents

Prepared by R. E. Burnham, patent and trade-mark attorney, 511 Eleventh street, N. W., Washington, D. C., from whom copies may be obtained at the rate of 25c each. State number of patent and name of inventor when ordering.

September 24, 1935

REFINING

Sulphur removal from hydrocarbon oils—William M. Malisoff, Philadelphia, Pa., assignor to Atlantic Refining Co. Filed Dec. 9, 1930. No. 2,015,080.

Method of cracking oil with accumulation under pressure—Charles A. Hillman, East Orange, N. J., assignor to Standard Oil Development Co. Filed Apr. 20, 1931. No. 2,015,110.

Process for breaking petroleum emulsions—Melvin De Groote, St. Louis, Mo., assignor to Tretolite Co. Filed May 9, 1935. No. 2,015,260.

Process for treating liquids with gases or vapors and apparatus therefor—Martin Luther and Karl Goetze, Germany, assignors to I. G. Farbenindustrie. Filed Aug. 11, 1928. No. 2,015,347.

Method of cracking oil in the vapor phase—Charles T. Chave, New York, and Hermann C. Schutt, North Tarrytown, N. Y., assignors to Gyro Process Co. Filed Feb. 16, 1935. No. 2,015,420.

Process of treating hydrocarbon products—William Leigemann, Newark, N. J. Filed May 15, 1934. No. 2,015,529.

October 1, 1935

REFINING

Process for producing highly refined anti-detonation motor fuel—Norman F. Black and Joshua A. Tilton, Baton Rouge, La., assignors to Standard-I. G. Co. Filed May 14, 1931. No. 2,015,703.

Internal stripper for bubble towers—John W. Packie, Green Village, N. J., assignor to Standard Oil Development Co. Filed June 19, 1931. No. 2,015,725.

Method of cracking oil—Harold Sydnor, Elizabeth, N. J., assignor to Standard Oil Development Co. Filed Mar. 20, 1931. No. 2,015,733.

Method of producing pour inhibitors—Per K. Frolich, Roselle, N. J., assignor to Standard Oil Development Co. Filed June 30, 1933. No. 2,015,748.

Hydrogenation of carbonaceous materials—Roland H. Griffith, Robert N. B. D. Bruce, and Samuel G. Hill, London, England, assignors to Gas Light & Coke Co., Westminster, England. Filed Aug. 17, 1933. No. 2,016,169.

MISCELLANEOUS

Wax coating composition—Carl Winning, Elizabeth, N. J., assignor to Standard Oil Development Co. Filed Aug. 29, 1933. No. 2,015,739.

Liquid metering device—Thomas A. Fee, Jr., Vancouver, B. C., Canada, assignor to Gasoline Energy Distributors Ltd., same place. Filed Apr. 26, 1933. No. 2,015,997.

Cleaning composition—Wilfred T. Doherty, Houston, Tex., assignor to Standard Oil Development Co. Filed Apr. 9, 1932. No. 2,016,265.

October 8, 1935

REFINING

Processes for desulphurizing hydrocarbons. Albert E. Buell and Walter A. Schulze, Bartlesville, Okla., assignors to Phillips Petroleum Co. Filed September 10 and June 10, respectively, 1932. Nos. 2,016,271 and 2,016,272.

Process of cracking naphtha and heavier oils in the vapor phase. Albert P. Sachs, Brooklyn, N. Y., assignor to Petroleum Conversion Corp. Filed Oct. 27, 1933. No. 2,016,297.

Conversion of hydrocarbon oils.

Richard F. Trow, Port Arthur, Tex., assignor to Texas Co. Filed May 19, 1931. Nos. 2,016,304, 2,016,948, 2,016,949, and 2,016,950.

Process of contacting hydrocarbon oil with a liquid reagent. Paul W. Merchant, Texarkana, Tex. Filed Aug. 8, 1929. No. 2,016,336.

Treatment of hydrocarbon oils. Jacque C. Morrell, Chicago, Ill., assignor to Universal Oil Products Co. Filed May 20, 1931. No. 2,016,339.

Process of sweetening petroleum oil. Philip S. Nisson, Brooklyn, N. Y., assignor to Gray Processes Corp. Filed Dec. 23, 1930. No. 2,016,342.

Treatment of hydrocarbon oils. Lyman C. Huff, Chicago, Ill., assignor to Universal Oil Products Co. Filed Mar. 30, 1931. No. 2,016,371.

Conversion of hydrocarbon oils. Edwin F. Nelson, Chicago, Ill., assignor to Universal Oil Products Co. Filed Apr. 24, 1933. No. 2,016,386.

Process of cracking large molecular hydrocarbons. Henry C. Penn-Rich, New York, N. Y. Filed Sept. 17, 1932. No. 2,016,651.

Conversion of hydrocarbon oils. Jacob B. Heid, Chicago, Ill., assignor to Universal Oil Products Co. Filed May 4, 1933. No. 2,016,781.

Process for pyrolitic decomposition of hydrocarbons. Maurice B. Cooke, New York, N. Y. Filed Mar. 12, 1932. No. 2,016,798.

Return bend fitting for oil stills. Herbert C. Stockman, Birmingham, Ala. Filed Feb. 15, 1933. No. 2,016,912.

MISCELLANEOUS

Lubricant mixture (cutting lubricant). Victor R. Abrams, Brunswick, Ga., and Carroll A. Hochwalt, Oakwood, Ohio, assignors to Sulflo Corp. of America, Boston, Mass. Filed Aug. 15, 1934. No. 2,016,532.

Stabilizer for gasoline. John W. Orelup, Summit, N. J. Filed Sept. 16, 1931. No. 2,016,648.

Gasoline nozzle. Michael N. Talnagi, Perth Amboy, N. J. Filed May 1, 1935. No. 2,016,730.

New Radio Program

NEW YORK—A new weekly musical radio series, designed to emphasize the "Friendly Service" of 50,000 Socony-Vacuum dealers was launched this week over 35 stations of the Columbia Broadcasting System.

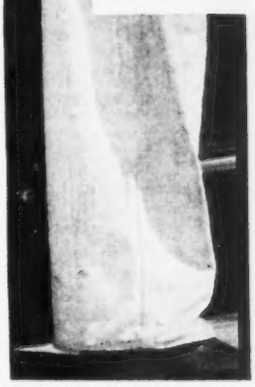
The program will be heard every Friday evening from 8:00 P. M. to 8:30 P. M. It will feature famous Americans as guests of honor in addition to the regular musical artists. The first was Dr. Roy Chapman Andrews, famous explorer, who told some stories from his thrilling life of exploration in the four corners of the world.

Aircraft Fuel Consumption

The average airplane, exclusive of government aircraft, flew 3.6 miles on a gallon of gasoline and a little over 100 miles on a gallon of lubricating oil in 1934, Department of Commerce figures show. The consumption of fuel was about 27 times that of lubricants. With government aircraft included, the gasoline consumption average was reduced but the lubricants consumption figure was increased.

Scheduled air-line services consumed 25,136,274 gallons of gasoline, miscellaneous flying 9,630,869, and government aircraft 23,647,113 gallons, it was indicated.

PYROIL
Simply add to Gas Oil and Grease
SAVES MOTORS



GENUINE PYROIL CONTAINS NO HARMFUL OILS OR ACIDS OR OTHER HARMFUL INGREDIENTS. AIDS THE EFFICIENCY OF ALLOY METALS AS WELL AS BABBITT AND OTHER METALS.

REASONS WHY PYROIL IS A GOOD PRODUCT TO SELL

This Pyroil illustration appeared recently in The Saturday Evening Post—a publication in which Pyroil advertisements have appeared regularly since 1931. Some twenty-five other nationally circulated publications—including Time, Country Gentleman, Fortune, Christian Science Monitor and Popular Mechanics—now carry Pyroil advertisements month to month or week to week. The power of such national advertising is reflected in the fact that Pyroil is on sale and in demand today in practically all civilized countries.

Pyroil is a product that gives unusual satisfaction. It has the unique ability to draw new trade to stations alert in servicing it. This, in itself is an accomplishment the value of which you know.

Why not bring Pyroil users to *your* station? We would like to send you a few facts to support our contention that this is what Pyroil will do. Mail the coupon below (or see 'phone book for local Distributor) for these—without obligation.

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The best place to test this pump is on a job that proved too tough for ordinary pumps. Seven sizes ---20 to 350 gallons per minute.

High Vacuum.. ..Self-Priming

WILL NOT VAPOR LOCK

The Type "T" Pump, with its balanced impeller giving continuous flow with no shock to the liquid, handles volatiles efficiently under adverse conditions. Long suction lines are readily evacuated. High lift, and excessive temperatures will not cause the pump to vapor lock. Because of its rugged simplicity, the pump gives years of trouble-free service with minimum attention.

Write for Bulletin 260-B 12.

ROOTS-CONNERSVILLE Blower Corporation
CONNERSVILLE, INDIANA

31 States Levy Tax on Diesel Fuel; Others Considering

CLEVELAND, Oct. 10

THIRTY-ONE states out of the 48, or 65 per cent, recognize Diesel fuel as a motor fuel and impose a fuel tax on it, according to a survey made recently by Joseph Geschelin, Detroit technical editor of Automotive Industries. Results of this survey were published in that journal of Sept. 28.

One-third of the states, or 17, do not have a tax on Diesel fuel and no machinery for collecting it, except in several special cases, but all of them are ready to spring a tax just as soon as the use of this fuel is sufficient to justify the bookkeeping involved, the survey indicates.

Six of these 17 states are now trying to determine whether their motor fuel tax laws cannot be interpreted to include Diesel fuel. These six are Alabama, Kansas, Louisiana, New Jersey, South Dakota and Virginia.

Two of these states, Utah and Vermont, "encourage" the use of Diesel vehicles by levying no direct tax on the fuel but they do charge twice the registration fee of a gasoline-powered vehicle for a Diesel-powered one. Effective Jan. 1, 1936, both will charge a special toll of 1.5 cents per operating mile of Diesel vehicles, which is above other normal vehicle taxes outside of the motor fuel tax.

In Illinois and Washington the Diesel operator pays the fuel tax direct rather than having the wholesaler collect it. Wisconsin requires the dealer to account for all sales and Kentucky requires the wholesale dealer to pay the tax.

Not all states which levy the regular motor fuel tax on Diesel fuel mention it by name in the tax law but the law is written sufficiently broad to cover any kind of fuel used in an internal combustion engine.

For the present, Mr. Geschelin concludes, the price of Diesel fuel plus tax still is lower than the cost of gasoline and in some locations it's lower. Even if the cost of the two fuels were to become identical, a good Diesel installation will justify itself on the basis of fuel economy, which, he says, should net a profit of at least 35 to 50 per cent on the fuel bill.

Accompanying table shows the amount of gasoline and Diesel tax in the various states.

STATE	Gasoline Tax	Diesel Fuel Tax
	Cents Per Gallon	
Alabama	6	No
Arizona	5	5
Arkansas	6½	6½
California	3	No
Colorado	4	4
Connecticut	2	2
Delaware	4	4
District of Columbia	2	2
Florida	7	No
Georgia	6	No
Idaho	5	5
Illinois	3	3
Indiana	4	4
Iowa	3	3
Kansas	3	3
Kentucky	5	5
Louisiana	5	No
Maine	4	No
Maryland	4	4
Massachusetts	3	4
Michigan	3	3
Minnesota	3	3
Mississippi	6	6
Missouri	2	2
Montana	5	No
Nebraska	4-5	4-5
Nevada	4	4
New Hampshire	4	No
New Jersey	3	No
New Mexico	5	5
New York	4	4
North Carolina	6	6
North Dakota	3	No
Ohio	4	4
Oklahoma	4	4
Oregon	5	5
Pennsylvania	4	4
Rhode Island	2	No
South Carolina	6	No
South Dakota	4	No
Tennessee	7	No
Texas	4	4
Utah	4	Special
Vermont	4	Special
Virginia	5	No
Washington	5	5
West Virginia	4	No
Wisconsin	4	4
Wyoming	4	No

Seek Colon Oil Receiver

WILMINGTON, Del., Oct. 2.—A suit has been filed in the Chancery Court here seeking the appointment of a receiver for the Colon Oil Corp. It charges mismanagement by the officers and directors. The suit was brought by Marie A. Ritter of New York, who was reported to own 1600 shares of stock in the company. Colon Oil is a member of the Royal Dutch-Shell group.

Oil Trademarks For Copyright

THE following are trademark applications pertinent to our field pending in the United States Patent office which have been passed for publication and are in line for early registration unless opposition is filed promptly. For further information address National Trade-Mark Company, Munsey Building, Washington, D. C., trademark specialists.

As an additional service feature to its readers, this journal gladly offers to them an advance search free of charge on any mark they may contemplate adopting or registering. You may communicate with the Editor of this Department, or send your inquiry direct to the National Trade-Mark Company, stating that you are a reader of this journal.

SUPERLA, Ser. No. 362,491. Standard Oil Company, Whiting, Ind., and Chicago, Ill. Filed Mar. 13, 1935. For Petrolatum.

GEARGLIDE, and comet formed of sprocket wheel, Ser. No. 367,679. Pate Oil Company, Milwaukee, Wis. Filed July 25, 1935. For Lubricating Oils and Greases.

SERVISHINE, Ser. No. 364,832. Phillips Petroleum Company, Bartlesville, Okla. Filed May 11, 1935. For Glass, Metal, and Porcelain Cleaner.

ABLE PENN, Ser. No. 368,146. Ohio River Refining and Terminal Co., Cincinnati, Ohio. Filed Aug. 9, 1935. For Motor Lubricating Oils and Lubricating Greases.

GOOD LUCK, Ser. No. 368,147. Ohio River Refining and Terminal Company, Cincinnati, Ohio. Filed Aug. 9, 1935. For Motor Lubricating Oils and Lubricating Greases.

FORMACIDE, Ser. No. 367,534. The Hammond Paint & Chemical Co., Inc., Beacon, N. Y. Filed July 22, 1935. For Insecticides.

Picture of a Fly on a Target with the words "Every Fly a Bull's Eye" written below it, Ser. No. 364,044. Johnson Oil Refining Company, Chicago, Ill. Filed Apr. 22, 1935. For Insecticide.

STRATOSPHERE. Ser. No. 367,158. W. Bigelow Ferris, Columbus, Ohio. Filed July 11, 1935. For Gasoline and Lubricating Oils and Also a Mixture of Alcohol and Liquid Hydrocarbon Fuels.

WOOLREX. Ser. No. 366,242. Socony Vacuum Oil Company, Inc., New York, N. Y. Filed June 15, 1935. For Textile Lubricating Oil.

Coming Meetings

(*Continued from page 9*)

Ohio Petroleum Marketers Association, Hotel Deshler-Wallick, Columbus, Ohio, Feb. 25, 26, 27.

American Association of Petroleum Geologists, annual meeting, Tulsa, Mar. 19, 20, 21.

National Petroleum Association, Cleveland Hotel, Cleveland, O., Apr. 16, 17.

International Petroleum Exposition and Congress, Tulsa, Okla., May 16 to 23.

Pennsylvania Grade Crude Oil Assn., 13th annual meeting, State College, Pa., June 18, 19.

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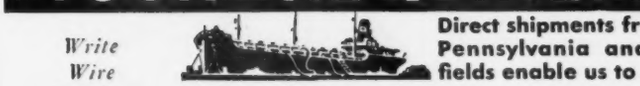

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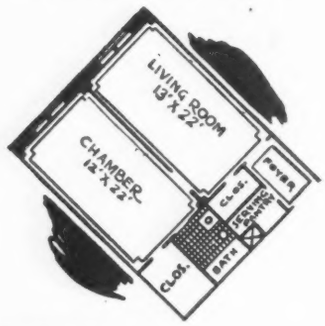

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What to Consider in Building Terminals

(*Continued from page* 92)

carrier transportation is employed. There is no government regulation of rates. Transportation rates are a widely variable proposition depending upon the character of the transportation companies and their boats, convenience in serving a particular terminal, whether return cargoes can be obtained, and other details. This is true of both river and lake transportation. On the river, upstream transportation is more costly than downstream, other things being equal, and the number and size of locks is an important consideration.

The time for shipments is usually longer than for rail shipment. Long hauls such as from Good Hope, La. to Pittsburgh require about 30 days for the round trip, which means more than 15 days for the trip upstream under load. Barge shipments from New York Harbor to Detroit are being made in 10 days for one way, Chicago to Cleveland is a 7-day trip, and from Albany to Buffalo takes 5 days.

Several private marine terminals have become public terminals in the sense that they have leased a part or all of their tankage to ther independent concerns or to major companies. This arrangement partakes of the nature of a co-operative undertaking and results in savings to both parties to the contract. Real co-operative companies also offer many possibilities or may make otherwise impossible ventures practical. As to the plant itself, which need not be on the water's edge since liquid products can be carried by pipeline to any desired point, locations are selected to conform with the safety code of the community, as near to a dock as possible, with access to both railroad and highway. The railway is often necessary for outgoing shipments although a number of the smaller river bulk plants employ trucks only to supply dealers. A pipeline has been built to a distant railroad siding by the Sun Oil Co. at its new plant at Cincinnati.

The most satisfactory plan, authorities state, is to own the property on which the terminal is built, the dock, and the railroad siding unless a very good lease is obtained. There are plants operating where all of these adjuncts are leased.

The ability to choose property away from the water gives a much wider selection than would be possible otherwise and probably can be put to advantage through differences in property values but a plant too far from the dock will amplify the pipeline problem both in regard to right-of-way and costs for laying. Property values are therefore balanced against other factors.

An approximate cost for laying pipeline has been estimated at $1000 per inch diameter per mile. Lines for unloading tankers are commonly 6 or 8 inches in diameter but river barges are being unloaded through lines from 2 to 6 inches.

The simplest kind of a dock is more than is actually required by the water terminal. A bulk head just to maintain sufficient depth of water at the water edge so that tankers can tie up to shore is the minimum requirement. Such a bulkhead must be built with a permit from the city, which maintains standards of strength to prevent collapse during dredging operations. The cost of building would be in the neighborhood of $75 to $80 per foot, it is estimated by one contractor. Dredging costs have been estimated at around $2000 average. In some locations, such as the Cuyahoga river at Cleveland, this dredging expense would be annual, in others only occasional.

Although the leasing of railroad property for building storage has met with resistance by railroad companies for competitive reasons it has been accomplished in a few instances in which tank cars shipments have been assured from the marine terminal. Such is the arrangement made by the Star Oil Co. and by Thiessen-Clemens of St. Joseph, Mich., in at least one of their plants.

Some figures on the cost of operation of a marine bulk plant are given by A. L. Christy, in charge of marine operations for the Pure Oil Co. The investment should average 7.5 cents per barrel throughput the year. Investment varies, however, from 5 cents to 40 or 50 cents per barrel per year, although the latter figures often apply to plants having other functions in addition to receiving and shipping bulk products. The costs are about the same for either river or deep water plants.

Operating cost should be around 2 cents a barrel throughput per year. Small plants are said to be operating at 5 cents a barrel but many are requiring 10 cents a barrel. This includes depreciation, taxes, insurance, and pay roll, all sizeable items.

An average radius of from 50 to 70 miles covers the area usually supplied by truck from water bulk plants,

Costs of Tankage in Cents per Barrel

Capacity (Bbls.)	Breather Type	Floating Roof Type	Horton Spheroid
10,000	66	81	80
25,000	46.5	55	59
55,000	33.5	41	49
80,000	30	37	42

and, the center of the circle being on water, the area covered is more often semicircular. Even rivers are more or less obstacles unless there are convenient bridges. Larger trucking units go as far as 100 miles or even 150 miles. In some instances trucks may handle all shipments from the terminal, in others only that portion which is not conveniently accessible by rail. These problems are very similar to an inland bulkplant.

Unlike many items about the water terminal which are too susceptible of variations of quantity or quality to warrant estimates of probable costs, tankage costs are more definite and, being a larger item than at inland plants, deserve some consideration. The Chicago Bridge & Iron Works has given the accompanying averages for four commonly used sizes which apply to welded construction. These costs do not take into consideration transportation costs of materials nor the laying of foundation but does include all equipment.

The price of tanks varies to a certain extent with diameter. Thus, for a tank of given capacity, a taller tank might be a little less expensive, particularly for the floating roof type.

Fire protection varies from none at all to the most elaborate installation that can be built. The foam system is the most universally used, with piping to the tops of tanks arranged to spread the foam from a central station. Where tanks are located within city limits, they are required by city ordinance to be surrounded by retaining earth or concrete walls with capacity considerably larger than the tank storage space to prevent the spread of oil in case of damage to the tank. On river banks these dykes may also serve to keep out high water.

The operator of a marine terminal usually does not have to worry about how his tanks are filled and therefore requires only the commonly used sizes of pumps for loading tank cars and trucks. Pumps and power for filling storage are supplied on both tankers and barges except in a few instances.

The principal consideration as far as unloading is concerned will be large enough unloading lines to provide an economical unloading time or fit the capacities of unloading pumps.

A whole book could be written about special accounting and contracts peculiar to marine terminal operation, it has been indicated. The space here available permits little more than the mention that there are many contract conditions which differ from inland terminals or bulk plants. Ownership of boats particularly multiplies the problems of contracts. As an example, in case of the injury of an employe of a towing company on your barge, does your employe indemnity insurance clear you of responsibility? If your barge, in charge of the towing company damages other boats, whose is the responsibility?

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Transactions in Oil Stocks on New York Stock Exchange

1934 High	1934 Low	1935 High	1935 Low	Listed Shares	Par Value	Company	Current Dividend	Last Div. Paid	Transactions Week Ended Oct. 12 Sales Shares	High	Low	Last	Week's Change
55⅝	39	71	48½	788,675	N.P.	Amerada Corp.	50cQ	July 31, 35	5,500	66	63¼	66	+ 3
40⅛	29½	40½	29¾	2,290,412	$25	Associated Oil Co.	45c	June 25, 35	.....	....	....	....	....
35¼	21½	28	20½	2,696,652	25	Atlantic Refining Co.	25cQ	Sept. 16, 35	11,000	21⅞	21	21¾	+ ⅜
10	5⅞	10⅝	5⅞	2,258,779	5	Barnsdall Corp.	‡	June 30, 35	14,200	9⅞	9⅛	9⅝	+ ⅜
9¾	5	8½	6¾	1,444,970	N.P.	Colonial Beacon Oil Co.	....	.....	350	7⅝	7⅜	7⅜	+ ⅛
14¼	7¼	10½	6½	13,996,072	N.P.	Consolidated Oil Corp.	25c	Oct. 10, 35	35,400	8½	7¾	8¼	+ ⅛
112⅛	108	112	109	132,771	$100	do pfd.	$2Q	Aug. 15, 35	100	110⅝	110⅝	110⅝	+ ⅛
22¾	15¾	23	15⅛	4,722,652	5	Continental Oil Co.	12½c	July 31, 35	30,200	20⅝	19⅝	20¼	+ ½
23½	12	20⅝	11¾	413,333	$10	General Asphalt Co.	....	.....	8,800	18⅛	17	17¾	+ ¾
29¾	12½	17¾	9½	95,841	100	Houston Oil Co.	....	.....	.....	....	....	....	....
5⅝	2½	4⅛	1½	678,234	25	do v.t.c.	....	.....	63,200	*4⅛	2¾	3⅞	+ 1¼
4¾	2⅜	2¾	2⅛	1,207,132	10	Indian Refining Co.	....	.....	1,200	2⅝	2⅜	2⅝	+ ⅛
3⅜	⅝	1⅞	⅜	1,309,060	N.P.	Louisiana Oil Ref'g. Corp.	....	.....	300	½	½	½	0
23½	7¼	14½	4½	40,000	$100	do pfd.	....	.....	70	8¼	7	8¼	+ 1¼
3¼	1¼	3	1	330,000	N.P.	Maracaibo Oil Exploration Co.	....	.....	800	1¾	1½	1½	— ¼
14¾	9⅛	13⅞	9½	1,857,912	$10	Mid-Continent Pet. Corp.	15c	June 1, 35	7,600	11	10	10⅞	+ ⅛
15⅞	8½	14⅛	9¼	6,563,377	N.P.	Ohio Oil Co.	15c	June 15, 35	15,300	10⅛	9⅜	10¼	+ ¼
11½	10⅜	12	10⅜	4,699,885	$5	Pan Amer. Pet. & Transp. Co.	....	.....	500	11⅜	11¼	11⅜	— ⅛
2½	⅝	1⅜	½	199,370	N.P.	Panhandle Prod. & Ref'g. Co.	....	.....	500	¾	¾	¾	0
21½	7	19½	6½	17,994	$100	do pfd.	....	.....	20	12¼	12¼	12¼	— 1⅛
14⅛	8¼	11⅝	7⅝	2,153,444	5	Petroleum Corp. of America.	50c	.....	2,400	10	9½	9⅝	+ ⅝
20¾	13⅜	30⅜	13¾	4,439,450	N.P.	Phillips Petroleum Co.	25cQ	Aug. 30, 35	56,852	*30⅜	28¾	29⅞	+ ½
1⅛	⅜	⅝	¼	1,184,817	$25	Pierce Oil Corp.	....	.....	1,900	½	⅜	½	+ ⅛
10¾	4½	6½	2¾	150,000	100	do pfd.	....	.....	.....	....	....	....	....
2	¾	1⅛	⅝	2,500,000	N.P.	Pierce Petroleum Corp.	....	.....	800	¾	⅝	¾	+ ⅛
16⅞	7¼	11⅝	6½	1,050,000	$5	Plymouth Oil.	25cQ	Mar. 30, 35	4,400	10⅜	9⅞	10⅛	+ ¼
14⅞	6⅛	10⅛	5⅞	3,038,370	N.P.	Pure Oil Co.	....	.....	23,500	8⅜	7⅝	8⅛	+ ½
63	33½	76½	34¾	167,640	100	do 6% pfd.	....	.....	900	71	69¼	71	+ 2¼
80	49	93	49⅝	130,000	$100	do 8% pfd.	....	.....	460	90	88½	90	+ 1
39⅛	28⅝	44¾	29½	425,342	a	Royal Dutch Co. (N. Y. shares).	$1.70	Aug. 1, 35	2,400	42½	41½	42½	+ 1¼
38⅝	20¾	35⅞	20¾	1,244,383	N.P.	Seaboard Oil of Del.	25cQ	Sept. 15, 35	12,000	29¾	28	29⅞	+ 1⅝
26½	19	37	20⅝	56,148	£2	Shell Transport & Trading Co.	$1.237	July 24, 35	800	35	33½	35	0
11½	6	11½	5½	13,070,625	N.P.	Shell Union Oil Corp.	....	.....	14,700	9¾	8¾	9⅝	+ ½
89	57	98½	63½	400,000	$100	do pfd w.w.	....	.....	1,600	91	89⅞	90½	+ 1¼
17⅛	7¼	18¾	5	461,000	10	Simms Petroleum Co.	**$10.00	July 5, 35	3,900	6⅜	5	5⅛	+ ¼
11½	6	11¾	6½	1,100,069	25	Skelly Oil Co.	....	.....	700	11	10⅜	11	+ ⅜
68½	51½	98	60	120,000	100	do pfd.	....	.....	.....	....	....	....	....
19⅛	12½	15¾	10⅝	31,701,348	15	Socony Vacuum Oil Co.	15c	Sept. 16, 35	58,000	11⅜	10⅝	11¼	+ ⅜
114	96½	116	111	764,925	100	S. O. Export Corp. pfd.	$2.50S.A.	June 29, 35	300	112¾	112½	112¾	+ ½
42⅞	26½	38⅞	27¾	13,102,900	N.P.	S. O. California.	25cQ	Sept. 16, 35	25,100	32⅞	32¼	32⅞	+ ⅝
32¾	23¼	28	23	15,215,677	$25	S. O. Indiana.	25c	Sept. 16, 35	13,500	25½	24½	25¼	+ ⅜
41	26	32	20	146,542	10	S. O. Kansas.	50c	Oct. 31, 34	200	20½	20¼	20¼	+ ¼
50⅛	39¼	50⅛	35¾	25,740,965	25	S. O. New Jersey.	50c s.a.	June 15, 35	31,300	45¼	43¾	44⅝	+ 1
74¼	51⅛	75½	60½	1,590,406	N.P.	Sun Oil Co.	25cQ	Sept. 16, 35	900	68⅞	67	68⅞	+ ⅞
118	100	121	115½	100,000	$100	do pfd.	$1.50Q	Sept. 3, 35	790	119½	118½	119⅜	+ ¾
3	1¼	3	1⅝	966,979	$1	Superior Oil Corp. (Del.).	....	.....	3,700	2¼	1⅞	2⅛	+ ⅛
29⅛	19⅝	23¾	16½	9,851,236	$25	The Texas Corp.	25cQ	Oct. 1, 35	54,400	21⅜	20	21¼	+ 1⅜
6½	2½	8⅝	3¼	930,570	10	Texas Pacific Coal & Oil Co.	....	.....	66,900	9¼	8¼	8¾	+ ⅜
14⅜	8	12	7⅝	5,998,919	N.P.	Tide Water Associated Oil Co.	....	.....	17,900	9⅛	8½	8⅝	+ ⅜
87	64½	103⅝	84	695,503	$100	do pfd C. T. V.	$1.50	Oct. 1, 35	900	99¾	97½	97½	— ½
40	24	43½	26¾	2,191,823	N.P.	Tide Water Oil Co.	50c	Sept. 30, 35	10	40	40	40	0
20⅛	11⅛	20⅛	14⅜	4,386,070	25	Union Oil of California.	25cQ	Aug. 10, 35	11,500	18⅞	17¾	18⅝	+ ⅞
25⅜	15⅝	26½	20⅞	1,200,000	N.P.	Union Tank Car Co.	30cQ	Sept. 3, 35	700	22	21¾	22	— ⅜
3⅛	1	1⅝	⅝	759,538	N.P.	Warner Quinlan Co.	....	.....	1,600	⅞	⅝	⅝	— ⅛
5¾	2	2⅝	1	431,443	$5	H. F. Wilcox Oil & Gas Co.	....	.....	200	2⅛	2	2	— ⅛

*New high. †New low. x Ex-div. **Dividends of liquidation. ‡Stock dividend. a Par 33 1/3 florins.

Standard Oil Stocks on New York Curb Market

1934 High	1934 Low	1935 High	1935 Low	Shares Issued	Par Value	Company	Current Dividend	Last Div. Paid	Transactions Week Ended Oct. 12 Sales Shares	High	Low	Last	Week's Change
11	6	11¼	6	36,000	$25	Borne Scrymser Co.	50c	Oct. 15, 35	.....	....	....	....	....
38	26	42	30½	200,000	50	Buckeye Pipe Line Co.	75cQ	Sept. 14, 35	100	39	38¾	39	+ 1
150	116	157	115	120,000	25	Chesebrough Mfg. Co.	$1.50	Sept. 27, 35	100	125	125	125	— 3½
14⅜	9⅜	23½	10	5,977,873	N.P.	Creole Petroleum Co.	....	.....	19,300	22¼	21⅜	22	+ ⅜
37	30	38	33¼	50,000	$50	Eureka Pipe Line Co.	$1Q	Aug. 1, 35	50	34	34	34	0
49½	33¼	64	44	8,968,479	N.P.	Humble Oil & Refg. Co.	25cQ	Oct. 1, 35	7,100	54¼	52⅝	54¼	+ 1¾
17⅞	12⅝	22½	15⅜	26,919,871	N.P.	Imperial Oil Ltd.	‡25cS.	June 1, 35	10,700	19⅝	19	19	+ ⅛
17½	12⅜	22½	16⅛		N.P.	do registered.	25cQ	June 1, 34	200	19½	19⅛	19½	+ ⅜
6⅞	3⅜	5⅜	3⅝	300,000	$10	Indiana Pipe Line Co.	15c S.A.	May 15, 35	100	5⅛	5⅛	5⅛	— ⅛
33¾	19⅜	38⅞	28	14,324,088	N.P.	International Pet. Co.	‡75cS.	June 1, 35	15,400	34½	33⅝	33⅞	+ ¼
9½	7	10½	6¾	509,000	$12.50	National Transit Co.	35c	Dec. 15, 34	500	9½	9⅜	9½	+ ⅜
4¾	3	4⅞	3	100,000	5	New York Transit Co.	15c S.A.	Oct. 15, 34	.....	....	....	....	....
7	4⅜	7	5¼	120,000	10	Northern Pipe Line Co.	25c S.A.	July 1, 35	.....	....	....	....	....
91	83½	107¼	90¼	562,122	100	Ohio Oil Co. pfd.	$1.50Q	Sept. 14, 35	400	103⅝	102½	102½	— 1½
8¼	3⅜	11	5⅞	400,000	25	Penn Mex. Fuel Co.	....	Dec. 22, 33	.....	....	....	....	....
5½	3½	5	3⅞	100,000	10	Southern Pipe Line Co.	15c	Sept. 3, 35	.....	....	....	....	....
26½	17½	28⅜	21⅝	1,200,000	25	South Penn Oil Co.	30c	Sept. 30, 35	2,200	25½	24¾	25½	+ ⅝
47	41	52½	45¼	35,000	50	South West Pa. Pipe Lines.	$1Q	July 1, 35	.....	....	....	....	....
18¼	14⅝	21⅝	18	2,604,790	10	S. O. Kentucky.	25c	Sept. 14, 35	1,900	20⅝	20	20⅜	+ ⅝
16⅞	8¼	12	7¾	188,403	25	S. O. Nebraska.	....	June 20, 34	20	11	11	11	0
28½	12⅜	19¾	11½	753,740	25	S. O. Ohio.	....	Apr. 16, 34	1,400	14¼	14	14¼	— ⅛
95	77½	99½	91	120,000	100	do 5% pfd.	$1.25Q	Oct. 10, 35	25	91	91	91	+ 1¼
4¼	2⅝	5¾	2¼	34,158	25	Swan Finch Oil Corp.	....	Dec. 1, 30	.....	....	....	....	....

*New high. †New low. ‡Imperial Oil Spec. 37½c June 1, 35. International Pet. Spec. 50c June 1, 35.
x Ex dividend.

S. O. Ohio Adds Esso Oil

CLEVELAND, Oct. 7.—Standard Oil Co. of Ohio has added Esso motor oil, product of Esso, Inc., subsidiary of the Standard Oil Co. of New Jersey, to its line at company owned and dealer stations through Ohio.

Selling at 35 cents a quart, Esso tops Sohio's line. Other grades including Sohio Penn at 30 cents; Sohio motor oil at 25 cents, Polarine at 20 cents and Renown at 15 cents per quart, are continued.

Danbury Jobber Marries

DANBURY, CONN.—John W. Leahy, Cities Service distributor at Danbury, married Miss Gladys Stetson of Portland, Me., this past week. Following the ceremony Mr. and Mrs. Leahy left for an ocean voyage to the south.

Oil and Royalty Stocks on New York Curb

1934 High	1934 Low	1935 High	1935 Low	Par Value	Company	Transactions Week Ended Oct. 12 Sales Shares	High	Low	Last	Week's Change
1 1/16	1/2	11/16	3/16	N.P.	American Maracaibo..	2,100	11/16	5/8	5/8	— 1/16
2 3/16	1	2 1/8	5/8	N.P.	Arkansas Nat. Gas....	600	2 1/8	1 7/8	2 1/8	+ 1/8
2 3/4	5/8	2 3/8	5/8	N.P.	do A.....	2,900	2	1 7/8	2	— 1/8
3 1/16	1 3/4	7	2 1/4	$10	do pfd.....	5,800	6 1/4	5 1/2	6	+ 1/2
5 3/8	12 3/4	16 1/4	14 1/2	N.P.	British Amer. Oil coup.	.....	....	....	....	....
5 1/2	1 1/8	4 1/4	1 5/8	$1/4	Carib Syndicate.....	2,000	2 3/4	2 3/8	2 1/2	+ 1/8
4 1/4	1 1/4	2 7/8	3/4	N.P.	Cities Service.....	29,800	2	1 5/8	2	+ 1/4
6 1/8	11 1/4	27 3/8	6 1/4	$100	do pfd.....	4,400	21	18 3/4	20 3/4	+ 1 1/4
2 1/2	1 1/8	3 1/4	5/8	10	do pfd. B.....	200	1 3/4	1 5/8	1 5/8	+ 1/8
3 1/2	9	23	6	100	do pfd. BB.....	40	20	17	20	+ 1
3 1/4	1/2	2 1/8	5/8	N.P.	Colon Oil Corp.....	900	1 3/4	1 5/8	1 5/8	— 1/8
1 3/4	3/8	1 1/2	1/8	N.P.	Columbia Oil & Gas vtc.	500	1	1	1	— 1/8
2	1 1/2	1 3/4	1	$1	Consolidated Royalty..	.....	....	....	....	....
3 1/8	1/2	7/8	1/4	N.P.	Cosden Oil.....	500	1/4	1/4	1/4	0
9	2 1/2	2	11/16	$100	do pfd.....	.....	....	....	....	....
1 1/4	3/4	1 1/2	5/8	N.P.	Crown Central Pet.....	9,900	*1 1/4	1 1/8	1 1/2	+ 3/8
7 1/2	4 1/8	6 5/8	4	N.P.	Darby Petroleum.....	400	4 1/2	†4	4 1/2	— 3/8
2 1/4	1	2	3/4	N.P.	Derby Oil & Refg.....	.....	....	....	....	....
....	....	20	20	N.P.	do pfd.....	.....	....	....	....	....
76 3/4	50	74 3/4	50 1/4	$25	Gulf Oil Corp.....	4,600	65	61 1/2	64	+ 1
4 1/2	1 1/4	4 1/4	1 3/8	N.P.	Indian Ter. Illg. Oil A	.....	....	....	....	....
4 1/2	1 1/4	4 1/4	1 1/8	N.P.	do B.....	700	2 1/4	2	2 1/4	+ 1/4
3	1 1/8	3	1 7/8	N.P.	Kirby Petroleum.....	100	2 5/8	2 5/8	2 5/8	+ 1/8
1/8	1/16	3/8	1/16	$25	Leonard Oil Dev.....	1,000	1/16	3/8	1/16	0
6	3 1/2	6 5/8	3 1/2	N.P.	Lion Oil Refg.....	200	4	3 7/8	4	+ 1/4
8 3/4	4 1/4	9 1/2	4 1/2	N.P.	Lone Star Gas.....	1,800	8 1/4	8	8 1/4	+ 3/8
8 3/4	5 1/4	10	4	N.P.	Margay Oil Co.....	.....	....	....	....	....
2 1/4	1	1	7/8	N.P.	Mexico-Ohio Oil.....	200	1	1	1	0
5	2 5/8	3 3/8	2	N.P.	Michigan Gas & Oil....	800	2	2	2	— 1/8
2 7/8	1	2 1/8	7/8	N.P.	Mid. States Pet. A vtc.	600	1 1/2	1 3/8	1 3/8	— 1/8
1 1/8	1/4	1/2	1/4	N.P.	do B vtc.....	600	3/8	1/16	1/16	— 1/16
3/4	1/2	3/8	1/4	$1	Mountain & Gulf.....	.....	....	....	....	....
5 1/2	4	5 1/2	4 1/8	10	Mountain Producers...	300	4 3/4	4 5/8	4 3/4	+ 1/8
18 7/8	1/8	18 3/4	13 1/2	N.P.	National Fuel Gas....	1,400	17 3/8	16 7/8	17 3/8	+ 3/8
2 1/2	1 3/4	3 1/4	2	$5	New Bradford Oil.....	400	2 5/8	2 1/2	2 1/2	0
3 1/8	1 3/4	3 1/8	2	N.P.	North Central Texas..	.....	....	....	....	....
1/2	1/2	1/2	1/2	N.P.	North European.....	4,000	1/16	1/8	1/8	0
10 5/8	8 1/4	11 3/4	9 1/2	N.P.	Oil Stocks Ltd. A.....	400	10 5/8	10 1/4	10 1/2	— 1/8
2 5/8	7/8	3 1/2	1 1/4	N.P.	Pantepec of Venezuela.	46,100	3 1/2	2 7/8	3 3/8	+ 1/2
3/8	1/8	1/2	1/8	N.P.	Producers Royalty....	800	3/16	1/8	3/16	0
63	33 1/2	70	34 3/4	$100	Pure Oil 6% pfd.....	.....	....	....	....	....
1 1/2	3/4	1	1/2	N.P.	Red Bank Oil.....	.....	....	....	....	....
1	1/2	1/4	1/2	N.P.	Reiter-Foster Oil.....	2,100	1/16	1/16	1/16	— 1/16
4	1/2	1 5/8	1/2	$25	Richfield Oil pfd.....	.....	....	....	....	....
1 1/4	3/4	4 1/2	1	..	Root Refining.....	3,000	4	3 1/2	3 5/8	— 1/4
8 1/4	3 1/2	12	4	10	do conv. pr. pfd...	200	10 1/8	10	10	0
....	....	....	....	$10	Royalty Corp. pfd.....	.....	....	....	....	....
3 3/8	7/8	1 1/2	5/8	N.P.	Ryan Consolidated.....	.....	....	....	....	....
1	1/2	1	1/2	$10	Salt Creek Consolidated	200	11/16	11/16	11/16	— 1/16
7 3/8	5	7 1/2	5 1/2	10	Salt Creek Prod.....	700	6 7/8	6 3/4	6 3/4	— 1/8
6	4 7/8	6 7/8	4 3/4	N.P.	Southland Royalty....	400	5 7/8	5 3/4	5 3/4	— 1/8
2	11/16	2	11/16	$5	Sunray Oil.....	6,400	2	1 7/8	2	+ 1/4
....	....	3 3/8	2	$1	Swiss Oil Corp.....	1,100	2 3/8	2 1/4	2 3/8	+ 1/8
11	4 3/4	6 7/8	5	N.P.	Texon Oil & Land.....	1,600	6 1/8	5 5/8	6 1/8	+ 1/4
1 1/8	1/2	3	7/8	$5	Venezuela Petroleum..	9,800	1 3/4	1 1/2	1 5/8	0
5 1/4	2 3/4	6 1/8	3 1/2	1	Woodley Petroleum...	800	5 5/8	5 1/4	5 1/4	— 1/4

†New low.

New York Bonds

Week Ended Oct. 12

	High	Low	Last	Change
Atlantic Refg. deb. 5s...	106 7/8	106 5/8	106 3/4	+ 1/8
Houston Oil 5 3/8s '40....	97 1/4	96 1/2	97 1/4	+2
Pan Amer. Pet. of Calif. 6s	42	40	40	— 1/2
Pan Amer. Pet. of Calif. 6s ctfs.....	41 1/4	40	40	0
Phillips Pet. 5 1/4s.....	101 5/8	101 3/8	101 5/8	0
Pure Oil 4 1/4s '50.....	98	97	97 3/4	+ 3/4
Richfield Oil of Calif. 6s.	31 3/4	29 1/2	31	+1
Richfield Oil of Calif. 6s ctfs.....	31 3/4	29 1/2	30 1/4	+ 3/4
Shell Union Oil 5s.....	103 3/8	102 1/2	102 3/4	— 1/4
Shell Pipe Line 5s.....	103 1/4	103	103 1/4	0
Skelly Oil 5 3/8s.....	102 3/4	102 1/4	102 3/4	+ 1/2
S. O. N. Y. 4 3/8s.....	101 3/8	101 1/4	101 3/8	+ 1/8
Union Oil of Calif. 6s A '42.....	119 1/4	119	119 1/4	+ 5/8
Warner-Quinlan 6s '39..	27	21 1/4	23 3/4	—5

Oil Dividends

Declared Last Week

Company	Amount	Record	Payable
Mid-Continent Pet.**...	25c	Nov. 1	Dec. 2
Union Oil of Calif. q.....	25c	Oct. 19	Nov. 9

**Paid 15c June 1, '35.

Dividends Waiting Payment

Amerada Corp., q.....	50c	Oct. 15	Oct. 31
Barnsdall Corp. q.....	15c	Oct. 10	Nov. 1
Barnsdall Corp. extra....	05c	Oct. 10	Nov. 1
Canadian Oil Cos. q.....	12 1/2c	Nov. 1	Nov. 15
Cons. Royalty Oil, q....	5c	Oct. 15	Oct. 25
Continental Oil.....	25c	Oct. 7	Oct. 31
Eureka Pipe Line q.....	$1.00	Oct. 15	Nov. 1
Indiana Pipe Line s.....	15c	Oct. 18	Nov. 15
Indiana Pipe Line extra..	5c	Oct. 18	Nov. 15
Pet. Corp. of Amer.....	3 1/3c	Oct. 11	Oct. 31
Phillips Pet. q.....	25c	Nov. 1	Nov. 30
Phillips Pet. extra.....	25c	Nov. 1	Nov. 30
Simms Pet.*.....	$1.25	Oct. 11	Oct. 18

*Liquidating dividend.

Pittsburgh Stock Exchange

Transactions Week Ended Oct. 11, 1935

	Sales	High	Low	Last	Change Over Week
Ark. Nat. Gas do pfd.	351	6	5 5/8	6	0
†Cities Serv.....	244	1 7/8	1 1/2	1 1/2	0
Col. Gas & Elec...	2,148	13 3/8	12 3/8	13 3/8	+1
†Gulf Oil of Pa...	1,100	64	64	64	0
Lone Star Gas....	5,585	8 3/8	8	8 1/4	+ 1/8
† do 6 p.c. conv. pfd.....	11	98	98	98	+1 1/2
Mountain Fuel Supply.....	1,812	5	4 7/8	5	0
Plymouth Oil....	117	10 1/8	9 5/8	9 3/4	+ 3/8
Shamrock Oil & Gas.....	815	1 3/4	1 5/8	1 3/4	0
†Standard Oil of N. J.....	606	45	43 1/4	45	+1 3/8

†Unlisted.

Cleveland Stock Exchange

Transactions Week Ended Oct. 19, 1935

	Sales	High	Low	Last	Change Over Week
Canfield Oil... ..	....	....	....	....	....
Nat'l Refining ...	110	3 1/2	3 1/2	3 1/2	0
do pfd.....	....	....	....	....	....

New York Curb Bonds

Week Ending Oct. 12

	High	Low	Last	Change
Cities Serv. 5s '50.....	56 1/4	53 1/4	56	+2 7/8
Cities Serv. 5s '66.....	55	53	55	+2 1/2
Cities Serv. G. 5 1/2s '42..	89 7/8	87 3/4	89 7/8	+2 1/2
Empire O & R 5 1/2s '42..	67 1/4	65 5/8	67 1/4	+1
Gulf Oil 5s '47.....	105 3/4	105 5/8	105 3/4	— 1/2
Valvoline Oil 7s '37.....	99 1/2	99 1/4	99 1/2	— 1/4

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East Coast Marketers Use Marine Transportation

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facilities will work in his benefit.

One of the recent developments in this type of distribution has been the storage warehouse terminal. These terminals, usually owned by nonoil companies, offer a storage service to any company, major, independent, or consumer, who has petroleum products to store. A typical example of such a plant is the Patterson Oil Terminals, Inc., at Paulsboro, N. J., about four miles below Philadelphia on the Delaware river. The plant covers 36 acres, with 700 feet of water front, and the largest tankers can be accommodated at its pier. The terminal was built seven years ago and had a capacity of 17,000,000 gallons, with facilities for handling five different grades of petroleum products. Today the storage capacity is 36,000,000 gallons and it can take care of 12 different grades. The tanks range in capacity from 200 barrels to 80,000 barrels.

Rail shipments are handled at a tank car loading rack, where 20 cars can be loaded at one time. A subsidiary company owns and operates two tow barges having a combined capacity of 5500 barrels. These are available to facilitate deliveries from the terminal to other water points. The terminal company issues negotiable warehouse receipts to its customers for their merchandise in storage and many customers utilize such receipts as collateral in financing their materials. Land is available for the erection of addition tankage for the storage of exclusive materials.

Picking some random spots along the east coast we find several independent companies making good use of water transportation. In Florida, the Orange State Oil Co., with headquarters at Miami owns one barge and charters another to supply its six water terminals at Jacksonville, Sanford, Tampa, St. Petersburg, West Palm Beach and Miami. In addition this company has 43 bulk distributing plants which are supplied from these water terminals.

Another large independent marketer along the east coast is the Hartol Products Corp., operating from Maine to Maryland and about 200 miles inland. From its storage base in Texas, this company charters tankers to bring gasoline, kerosine and heating oils to its ocean terminals at Bayonne and Paulsboro, N. J., and Revere, Mass.

The Bayonne terminal, with 330,000 barrels capacity, serves five other water terminals by barge and makes other shipments by tank car and tank truck. These terminals are located in Elizabethport, N. J., Troy, N. Y., Hartford, Conn., and Syracuse, N. Y., the latter being on the Erie canal. Shipment out of these five terminals is done by truck.

The ocean terminal at Paulsboro receives its cargo from Texas and ships out by barge, tank car and tank truck, as does the Revere ocean terminal.

Water terminals, plus tank truck distribution, have made it possible for this company to enter territories where formerly freight rates prohibited such expansion. In connection with its water transportation development, Hartol has urged its customers to put in large storage tanks so that larger deliveries can be made, thus saving the customer money. It is quite common for contract truckers to haul products 75 miles inland from the Hartol terminals.

The Quality Oil Co., of Winston-Salem, N. C., 225 miles inland from its supply base on the east coast, an ocean terminal at Wilmington, N. C., has found it profitable to transport its gasoline between these points by truck.

In Fall River, Mass., is another independently owned water terminal, operated and owned by the James B. Berry Sons Co. and the Pennsylvania Petroleum Products Co. Ocean tankers come directly to the dock at this terminal and unload into seven storage tanks. These tanks have a combined capacity of 350,000 barrels. The fireproof construction of this plant is said to have resulted in allowing it one of the lowest fire insurance rates of any marine terminal in existence.*

This terminal supplies the other water

*See N. P. N. March 13, 1935, page 66.

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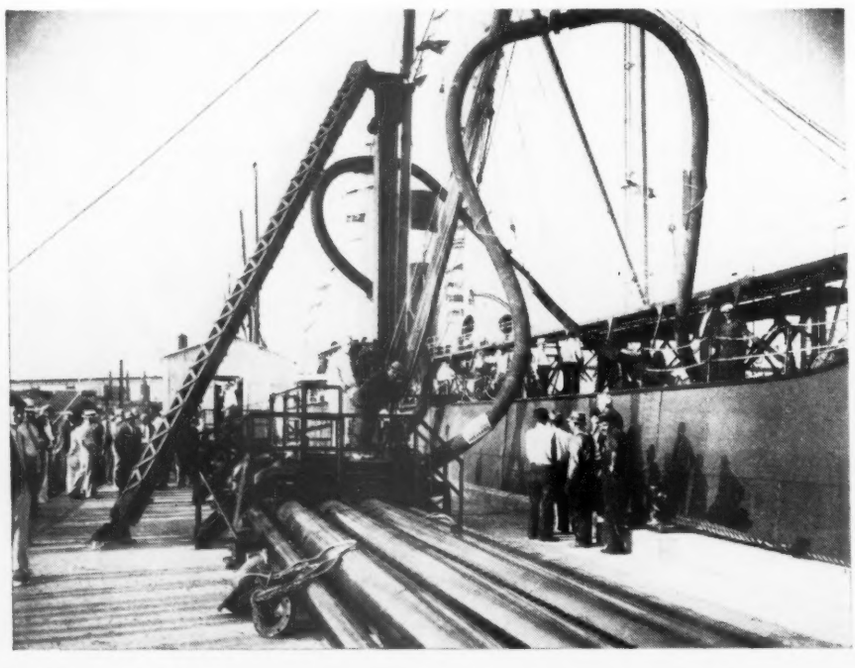
Unloading the Standard Shipping Co.'s tanker, F. W. Abrams, at Bayway. The crude is pumped through two flexible cargo hoses and into the 16-inch lines on the dock



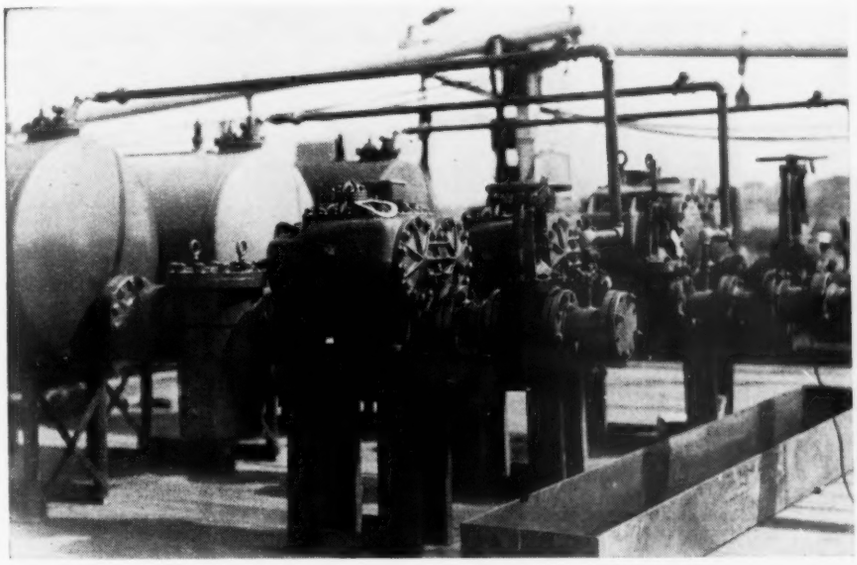
How one large oil company operating in states bordering the Atlantic receives and ships from its various terminals

Depot	Receives By	Delivers By
Chelsea, Mass.	O-B	R-T
Fall River, Mass.	O-R	B-R-T
Gloucester, Mass.	B	T
Salem, Mass.	B-T	T
E. Providence, R. 1.	B	T
Bangor, Me.	B-R	R-T
Gardiner, Me.	B-R	T
Portland, Me., No. 2.	O-B-R	B-R-T
S. Portland, Me., No. 1	Relay	R
Newington, N. H.	B-R	R-T
Burlington, Vt.	B-R	R-T
Bridgeport, Conn.	B-R	T
Groton, Conn.	B-R	T
E. Hartford, Conn.	B-R	T
New Haven, Conn.	B-R	R-T
Brooklyn, N. Y.	B	T
Mt. Vernon, N. Y., No. 1	B	T
Inwood, N. Y.	B	T
Newtown Creek, N. Y.	B	T
Pt. Washington, N. Y.	B	T
Verplanck, N. Y.	B	T
Court Street, N. Y.	B	T
Patchogue, N. Y.	B	T
Mt. Vernon, N. Y., No. 2	B	T
Milton, N. Y.	B-T	T
Rensselaer, N. Y.	O-B-R	B-T-R
Schenectady, N. Y.	B-R	R-T
Utica, N. Y.	B-R	R-T
Rochester, N. Y.	B-R	R-T
Syracuse, N. Y.	B-R	R-T
Buffalo, N. Y.	B	R
Trenton, N. J.	B-T	T
Philadelphia, Pa.	B-T	R-T
E. Rutherford, N. J.	B	T-P
Sewaren, N. J.	O	B-T-R
Bayonne, N. J.	O	B-T-R
Alexandria, Va.	B-R	R-T
Wagners Pt., Balt., Md.	O	B-R-T
City Point, Va.	B	R-T
Richmond, Va.	B	R-T
Portlock, Va.	B	R
Wilmington, N. C.	O	R-T-B

Legend

O—Ocean Tanker B—Barge T—Truck
R—Rail P—Pipeline

Products shipped from the Tide Water Oil Company's Revere, Mass., ocean terminal in barges are metered at the dock. This view shows the meters and air eliminators. The first two meters are the 4-inch size, and the last one is a 6-inch



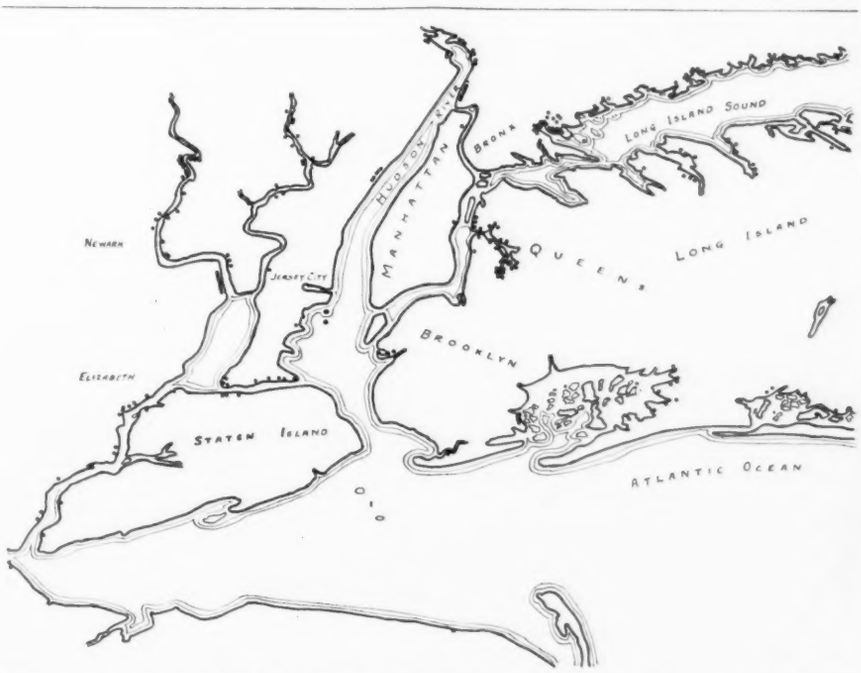
terminals of the Pennsylvania company at Bath, Me., Boston, Mass., Stonington, Conn., and Providence, R. I. The Berry Co. terminals at Boston and Glastonbury, Conn., are also supplied by the Fall River plant. A 200,000-gallon barge, owned by the Pennsylvania Petroleum Products Co., supplies some of the terminals. In addition, a tug is owned by Louie Pierce, president of the latter company.

Besides these vessels, the Pennsylvania company owns a diesel-powered, 240,000-gallon tanker that operates between the coastal points. This ship, the construction of which was supervised by Mr. Pierce, has an interesting history. Now a modern oil carrier known as the S. S. SEABOARD, it was at one time a passenger ship running between Boston and New York. That was 50 years ago.

When Mr. Pierce took it over, it was entirely rebuilt, the reconstruction program taking three years. All woodwork was removed. New steel plates were placed over the iron plates. Bulkheads were installed, dividing the ship into seven compartments.

The tanker is 185 feet long, has a 28-foot beam, and draws 10 feet of water when fully loaded. It has a crew of ten.

The ship is all welded. The main



There are approximately 200 water terminals handling oil products, shown on this map by black dots, in New York and vicinity. (Copyright 1934. Redrawn by special permission of Truss-Weld Division of United Dry Docks, Inc., New York City)

THE OIL INDUSTRY EXCHANGE

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Barges owned by the Standard Oil Co. of N. J. being loaded at the Midland, Pa., pipe line terminal. Gasoline is pumped through pipelines from the Atlantic Coast to Midland, and then shipped by barge down the Ohio river to points above Parkersburg, W. Va.

engine is a 500-horsepower diesel, and the cargo pumping engine is a 65-horsepower diesel. It can be unloaded at either side and pumped out through 6-inch lines at the rate of 42,000 gallons per hour.

In New England we also find other independent operators who are using water transportation to advantage. The Quincy Oil Co. receives petroleum products by ocean tanker at Quincy, Mass., and at Chelsea, Mass., a suburb of Boston, the 235,000-barrel water terminal of the Jenney Mfg. Co. also receives its ocean shipments.. Products leave these terminals by barge, rail, and truck.

Among the larger companies, distribution of products by water reaches tremendous proportions, with many of the companies owning large fleets of vessels in addition to their many well spotted terminals along the coast. The Sun Oil Co., for example, owns 15 ocean tankers, 7 diesel power barges, and 11 tow barges. The Gulf Refining Co. owns 37 ocean tankers and 47 barges.

The Sun Oil Co. has 27 east coast water terminals, both on the ocean and inland streams, between Rhode Island and Maryland, not including 21 others on inland canals and rivers. The Gulf Refining Co. has 29 terminals on the coast or accessible to it. The American Oil Co. has 15 ocean terminals extending from Maine to Florida, and 19 additional barge plants throughout the east coast district. Shell Eastern has eight terminals that receive products by ocean tanker and 34 which receive barge shipments.

Many improvements are now being made along the Atlantic coast to facilitate and speed up shipping. The Cape Cod canal, which cuts 65 miles from the distance between New York and Boston and points north, is being widened and deepened. The canal itself is 7.6 miles long and 22 feet deep at mean low water. At present it can accommodate only about 20 per cent of the ships that might use it. Work is now going on to widen this canal to 540 feet and deepen it to 32 feet. It will then permit passage of 80 per cent of the traffic. At the present time 40 per cent of the total traffic through the canal is petroleum products.

The Delaware river from Philadelphia to Trenton is now being widened from its present depth of 20 feet to 25 feet. The Chesapeake and Delaware canal, connecting the Delaware river with Chesapeake Bay, is undergoing a $13,000,000 improvement by widening to 250 feet and deepening to 27 feet. It was 90 feet wide and 12 feet deep. This will be an aid to the shippers of petroleum products in that district, as about 80 per cent of the shipping tonnage in that territory is that commodity.

The Hudson river as far as Albany, which is the limit for ocean-going vessels, is to be deepened to 27 feet, and many of the corners removed and the curves straightened out.

An allocation has already been made by President Roosevelt that will begin work on the new $146,000,000 cross-state ship canal for Florida. Extending from the Atlantic to the Gulf by way of St. John's river, Jacksonville, Palatka, the Oklawaha and Withlacoochee rivers and a point near Port Inglis, the canal route promises to vessels that now have to sail around Florida a possible saving of 2.5 days. It is understood that this would mean a saving of $7,000,000 to shipping interests alone.

The canal would be 195 miles from deep water to deep water, 100 miles of which would follow natural waterways. It is understood vessels would require an average of 25 hours for transit.

A quick look at some of the statistics for 1934 will reveal the gigantic size of this business of transporting petroleum products by water. At the port of Boston, for instance, coastwise receipts of crude oil were 11,362,582 barrels; of fuel oil, 2,675,763 barrels; and gasoline, 1,149,818 barrels. The coastwise shipments of gasoline from Boston were 2,543,677 barrels. Fuel oil shipments amounted to 785,984 barrels.

In Providence the receipts for 1934 were: Fuel oil, 5,488,090 barrels; gasoline, 2,955,300 barrels; crude oil 982,328; and kerosine, 923,412. The largest classified product shipped from Providence was gasoline, registering 690,511 barrels.

In the Port of New York, where there are nearly 200 marine terminals owned by consumers, jobbers, and major oil companies, the total shipments of petroleum and its products in 1933 amounted to 59,335,948 barrels.

In 1934, the receipts of crude oil on the Delaware river, from Philadelphia to the sea, amounted to 39,315,939 barrels. The fuel oil figure was 3,714,205 barrels; and the gasoline receipts 3,980,955 barrels. Shipments on fuel oil were 3,356,013 barrels, and on gasoline, 8,027,387 barrels.